UNITED STATES OF AMERICA

BEFORE THE

DEPARTMENT OF ENERGY

OFFICE OF ELECTRICITY DELIVERY AND ENERGY RELIABILITY

Docket No. PP-____

APPLICATION OF CENTRAL MAINE POWER COMPANY FOR A PRESIDENTIAL PERMIT FOR THE NEW ENGLAND CLEAN ENERGY CONNECT

July 26, 2017

Pursuant to Executive Order 10485, as amended by Executive Order 12038, Central Maine Power Company hereby applies to the United States Department of Energy for a Presidential Permit authorizing the construction, operation, maintenance, and connection of facilities for the transmission of electric energy at the international border between the United States and Canada. This application is made pursuant to the United States Department of Energy's applicable administrative procedures (10 C.F.R. §§ 205.320, *et. seq.*).

Contents

GLOSSARY

AC	Alternating current
ANSI	American National Standards Institute
APE	Area of Potential Effects
ASCE	American Society of Civil Engineers
ASH	Atlantic Salmon Habitat
AT	Appalachian National Scenic Trail
BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
CCIS	Compatibility Interconnection Standard
CEII	Critical Energy Infrastructure Information
CFR	Code of Federal Regulations
CMP	Central Maine Power Company
CNMV	Spanish National Securities Commission
CPCN	Certificate of Public Convenience and Necessity
CWA	Clean Water Act
DC	Direct current
dB	Decibels
dBA	Sound Pressure Level
DFR	Digital Fault Recording
DG	Distributed generation
DIA	Diameter
DOE	U.S. Department of Energy
DOI	U.S. Department of the Interior
DPS	Distinct Population Segment
DWA	Deer Wintering Area
EMF	Electromagnetic fields
EMI	Electromagnetic interference
EPRI	Electric Power Research Institute
ERRP	Emergency Repair and Response Plan
ESA	Endangered Species Act
ESC	Erosion and Sedimentation Control
°F	Degrees Fahrenheit
FERC	Federal Energy Regulatory Commission
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FIRM	Flood Insurance Rate Maps
FR	Federal Register
GHz	Gigahertz
GHG	Greenhouse Gas
GIS	Geographic Information System
GPM	Gallons per minute
GPS	Global Positioning System
HVAC	High voltage alternating current
HVDC	High-voltage direct current

Hz	Hertz
IEEE	Institute of Electronics and Electronics Engineers
IGBT	Insulated Gate Bipolar Transistor
ISO-NE	Independent System Operator-New England
ISM	Industrial, Scientific and Medical
KOP	Key Observation Point
kV	Kilovolt
LUPC	Maine Land Use Planning Commission
MBTA	Migratory Bird Treaty Act
MDEP	Maine Department of Environmental Protection
MDIFW	Maine Department of Inland Fisheries and Wildlife
MFS	Maine Forest Service
MHz	Megahertz
MW	Megawatt
MHPC	Maine Historic Preservation Commission
MIS	Minimum Interconnection Standard
MNAP	Maine Natural Areas Program
MPRP	Maine Power Reliability Project
MPUC	Maine Public Utilities Commission
MRIS	Maine Resource Integration Study
NECEC	New England Clean Energy Connect
NESC	National Electric Safety Code
NETA	InterNational Electrical Testing Association
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NPCC	Northeast Power Coordinating Counsel
NPRA	Maine Natural Resources Protection Act
NRHP	National Register of Historic Places
NWI	National Wetlands Inventory
OATT	Open Access Transmission Tariff
O&M	Operating & Maintenance
PEM	Palustrine Emergent Wetlands
PFO	Palustrine Forested Wetlands
POI	Point of Interconnection
PSS	Palustrine Scrub-Shrub Wetlands
RFP	Mass. Request for Proposals for Long-Term Contracts for Clean Energy Projects
RHA	Rivers and Harbors Act of 1899
RTE	Rare, Threatened and Endagered
RTU	Remote Terminal Units
Regie de l'energie	Québec Energy Regulatory Agency
ROW	Right of way
SCADA	Supervisory Control and Data Acquisition
SDAL	Summer Drastic Action Limit Rating
SEC	Securities and Exchange Commission

SIS	System Impact Study
SLODA	Maine Site Location of Development Act
SLTE	Summer Long Time Emergency Rating
SNORM	Summer Normal Rating
SPCC	Spill Prevention, Control and Countermeasures
SSTE	Summer Short Time Emergency Rating
TWh	Terawatt
USACE	U.S. Army Corps of Engineers
USEPA	U.S. Environmental Protection Agency
USFS	U.S. Forest Service
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
USGS NHD	U.S. Geological Survey - National Hydrography Dataset
USNPS	U.S. National Park Service
VIA	Visual Impact Assessment
VSC	Voltage Sourced Converter
WDAL	Winter Drastic Action Limit Rating
WLTE	Winter Long Time Emergency Rating
WNORM	Winter Normal Rating
WSTE	Winter Short Time Emergency Rating

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Statutes:

<u>Maine</u>

Erosion and Sedimentation Control Law, 38 M.R.S. § 420-C

Maine Waste Discharge Law, 38 M.R.S. §§413, *et seq.*

Natural Resources Protection Act, 38 M.R.S. §§ 480-A, *et seq.*

Site Location of Development Act, 38 M.R.S. §§ 481, *et seq.*

Slash Law, 12 M.R.S. § 9333

Stormwater Management Law, 38 M.R.S. § 420-D

<u>Federal</u>

Bald and Golden Eagle Protection Act, 16 U.S.C. 668-668d

Clean Water Act of 1972 (CWA), 33 U.S.C. § 1251, *et seq.*

Endangered Species Act of 1973, 16 U.S.C. §§ 1531, *et seq.*

Migratory Bird Treaty Act of 1918, 16 U.S.C. §§ 703–712

National Historic Preservation Act of 1966, 16 U.S. C. § 470

Rivers and Harbors Act of 1899, 33 U.S.C.

SECTION 1 INFORMATION REGARDING THE APPLICANT

1.1. LEGAL NAME AND DESCRIPTION OF APPLICANT

Central Maine Power Company (CMP) is a regulated electric transmission and distribution utility serving approximately 615,000 customers in central, western and southern Maine. CMP's transmission services are regulated by the Federal Energy Regulatory Commission (FERC) and its distribution services are regulated by the Maine Public Utilities Commission (MPUC). CMP's principal place of business is 83 Edison Drive, Augusta, ME 04336. CMP will construct, own and operate the New England Clean Energy Connect (NECEC or the Project).

CMP is an experienced and financially strong developer and operator of transmission facilities in New England, with a proven track record of delivering major transmission projects on time and on budget. CMP's recent completion of the Maine Power Reliability Project (MPRP), a $1.4 billion transmission project to improve the reliability of the New England Transmission System, which included constructing a total of 440 miles of transmission lines, including 184 miles of new 345 kV transmission lines, 100 miles of new 115 kV transmission lines, and 156 miles of rebuilt transmission lines, and constructing six new substations and major expansions to six existing substations, demonstrates CMP's capabilities. In addition, CMP has the full support of its parent companies, AVANGRID, Inc. (AVANGRID) and Iberdrola, S.A. (Iberdrola), which together are among the United States' and the world's largest energy companies. CMP has and will draw on their significant experience and expertise developing large transmission projects, including HVDC projects, and financial strength, to successfully complete the Project on time and on budget.

1.2. LEGAL NAMES OF ALL PARTNERS

CMP is the sole applicant for this Presidential Permit.

1.3. CORRESPONDENCE AND COMMUNICATIONS

All correspondence and communications should be directed to the following representatives:

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1.4. FOREIGN OWNERSHIP AND AFFILIATIONS

CMP Group, Inc. owns 100% of outstanding shares of CMP's common stock. CMP Group, Inc. is a wholly-owned subsidiary of Avangrid Networks, Inc., which in turn is a wholly-owned subsidiary of AVANGRID, a New York corporation listed on the New York Stock Exchange (NYSE: AGR). AVANGRID is a diversified energy and utility holding company with more than $30 billion in assets and operations in 27 states across the United States.

Iberdrola, a corporation (*sociedad anónima*) organized under the laws of the Kingdom of Spain (BME: IBE), a worldwide leader in the energy industry, directly owns approximately 81.5% of the outstanding shares of AVANGRID common stock, with the remaining shares publicly traded on the New York Stock exchange. The shares of Iberdrola are listed in the Madrid, Bilbao, Barcelona and Valencia stock exchanges.

With respect to ownership or direct or indirect assistance by a foreign government or instrumentality thereof, as required by Section 205.322(a)(4), according to the information provided to CMP by Iberdrola, (i) Qatar Investment Authority, the sovereign wealth fund of the State of Qatar, has reported that it indirectly holds an interest of approximately 8.509% in Iberdrola and (ii) Norges Bank, the central bank of the Kingdom of Norway, has reported that it directly owns approximately a 2.995% interest in Iberdrola.

In addition, based on the information provided to CMP by AVANGRID, Norway's Government Pension Fund Global managed by Norges Bank Investment Management has reported that it holds a small interest in AVANGRID's common stock (approximately 0.38%).

Iberdrola and AVANGRID are publicly traded companies and, thus, information is not available on a daily basis about the interests of all shareholders in the respective companies share capital or the underlying beneficial ownership thereof, if applicable.[1]

[1] In determining ownership or direct or indirect assistance by foreign governments or instrumentalities thereof, the companies have relied on the following sources of information: notices sent by shareholders to the Spanish National Securities Commission (CNMV), beneficial ownership reports and statements filed by certain institutional investors and/or beneficial owners with the U.S. Securities and Exchange Commission (SEC), information on shareholders of record provided to AVANGRID by its transfer agent and notices provided directly by shareholders to Iberdrola or AVANGRID. In relation to Iberdrola, since May 7, 2014, the company is a member within Iberclear of the Communication Service for securities holdings and the balanced list of buyers and sellers, obtaining, therefore, information from Iberclear, as well. Please note that these sources of information may not be comprehensive and other governments or governmental instrumentalities may have record or beneficial ownership interests in Iberdrola or in AVANGRID of which CMP is not aware.

1.5. EXISTING CONTRACTS WITH FOREIGN ENTITIES FOR PURCHASE, SALE OR DELIVERY OF ELECTRIC ENERGY

CMP purchases power from Hydro Québec, a Canadian utility, under Hydro Québec's tariff approved by the Québec Régie de l'énergie. CMP uses the electricity to serve retail customers located in Coburn Gore, Maine which is not physically connected to CMP's system.

1.6. OPINION OF COUNSEL - CORPORATE AUTHORITY AND COMPLIANCE WITH LAWS

Exhibit A hereto includes a signed opinion of counsel attesting that the construction, connection, operation, and maintenance of the proposed NECEC is within CMP's corporate powers and that CMP has complied with or will comply with all pertinent Federal and State laws.

SECTION 2 INFORMATION REGARDING TRANSMISSION LINES TO BE COVERED BY THE PRESIDENTIAL PERMIT

2.1. PROJECT OVERVIEW AND GENERAL PROJECT DESCRIPTION

CMP proposes the NECEC to transport electric power from the Canadian Border to the New England Control Area in response to the Request for Proposals for Long-Term Contracts for Clean Energy Projects dated March 31, 2017 (RFP) issued by the electric distribution companies of the Commonwealth of Massachusetts[2] and the Massachusetts Department of Energy Resources. The NECEC is a High Voltage Direct Current (HVDC) transmission solution capable of delivering 1,200 MW of Clean Energy Generation from Québec to the New England Control Area. On July 27, 2017, CMP plans to propose the NECEC as part of joint bids for Clean Energy Generation to be supplied by Hydro Renewable Energy LLC (HRE), an affiliate of Hydro Québec, and a joint venture of Gaz Metro Limited Partnership (Gaz Metro) and Boralex Inc.

CMP respectfully submits, for the reasons set forth in this Presidential Permit application, that the NECEC will not have a significant environmental impact or an adverse impact on the operation of the U.S. power supply system under normal or contingency conditions. In fact, the NECEC will improve reliability and stability of the electric grid in the New England Control Area. Therefore, the NECEC is consistent with the public interest and the U.S. Department of Energy (DOE) should grant CMP a Presidential Permit to construct and own the border crossing facilities required for the NECEC.

For the purposes of this Presidential Permit Application, the NECEC consists of proposed transmission facilities from the Québec-Maine border to the point of first

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[2] National Grid, NStar Electric d/b/a Eversource Energy, Fitchburg Gas & Electric Light Company d/b/a Unitil, and Western Massachusetts Electric Company d/b/a Eversource Energy.

interconnection with the New England Transmission System at CMP's existing Larrabee Road Substation in Lewiston, Maine (Larrabee Road Substation). Project maps of the preferred and alternative routes are attached as Exhibit C. The NECEC facilities include (1) a 100 foot segment crossing the border, (2) approximately 145.3 miles of +/- 320 kV overhead HVDC transmission line from the border crossing to, (3) a new 345kV AC to +/- 320kV HVDC 1,200MW converter station at the Merrill Road Substation in Lewiston Maine (Merrill Road Converter Station), which will convert the electrical power from direct current (DC) to alternating current (AC), (4) a 1.2 mile, above-ground 345 kV AC transmission line from Merrill Road Converter Station to the existing Larrabee Road Substation (and associated rebuild of 0.8 mile of 34.5 kV transmission line to make room in the corridor for the new 1.2 mile line), and (5) a 345 kV line terminal at the Larrabee Road Substation.[3]

CMP is the developer of the portion of the NECEC from the Québec-Maine border to the Lewiston, Maine area and all transmission upgrades on the U.S. side of the border. All of the U.S. facilities are located in Maine. The NECEC project will cross the Québec-Maine border in the northwest corner of Maine in Beattie Township. The final location of the border crossing is subject to further consideration based upon the route of the Canadian transmission facilities. Exhibit D is a map illustrating a range of potential crossing points on the Québec-Maine border. The Québec portion of the NECEC will be constructed, owned and operated by Hydro Québec TransEnergie, Inc. (HQT), an affiliate of Hydro Québec and HRE. HQT is not affiliated with CMP.

Although not a part of this Application, CMP also will (1) construct a 26.5 mile above ground 345 kV transmission line from the existing Coopers Mills Road Substation in Windsor, Maine to the existing Maine Yankee Substation in Wiscasset, Maine, (2) rebuild two other existing AC transmission lines in Maine and (3) make certain other improvements at existing substations within Maine. These facilities are network upgrades needed to permit the interconnection of the NECEC under the applicable ISO New England (ISO-NE) interconnection standards and tariff provisions.

The NECEC will provide a low-cost, technically viable, financeable solution for the clean energy needs of New England. Constructible in a commercially reasonable timeframe by some of the largest and financially strongest energy companies in the northeast, the Project will enhance electric reliability without a significant environmental impact and the clean energy the NECEC will deliver will benefit the environment by introducing renewable power to the electric grid in New England.

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[3] In addition to the NECEC facilities from the border to the Larrabee Road Substation, the NECEC also includes approximately 80 miles of +/- 320 kV overhead HVDC transmission line that will run from the existing Appalaches Substation in Canada to the Québec-Maine border. In addition, certain upgrades to the existing high voltage alternating current New England transmission system in Maine are necessary to permit the interconnection of the NECEC at the Larrabee Road Substation. These network upgrade facilities, which CMP will construct in conjunction with the NECEC, are described in this Section 2.1 and Section 2.2.3 of this Application, but are not the subject to a Presidential Permit because they are located downstream of the first interconnection with the New England Transmission System. However, the upgrade facilities in Maine will be subject to various state and other federal approvals as part of these agencies' consideration of the NECEC.

The Maine portion of the NECEC up to the first point of interconnection with the grid consists of the following transmission facilities:

2.1.1. Core Project Elements:

2.1.1.1. Transmission Line Equipment:

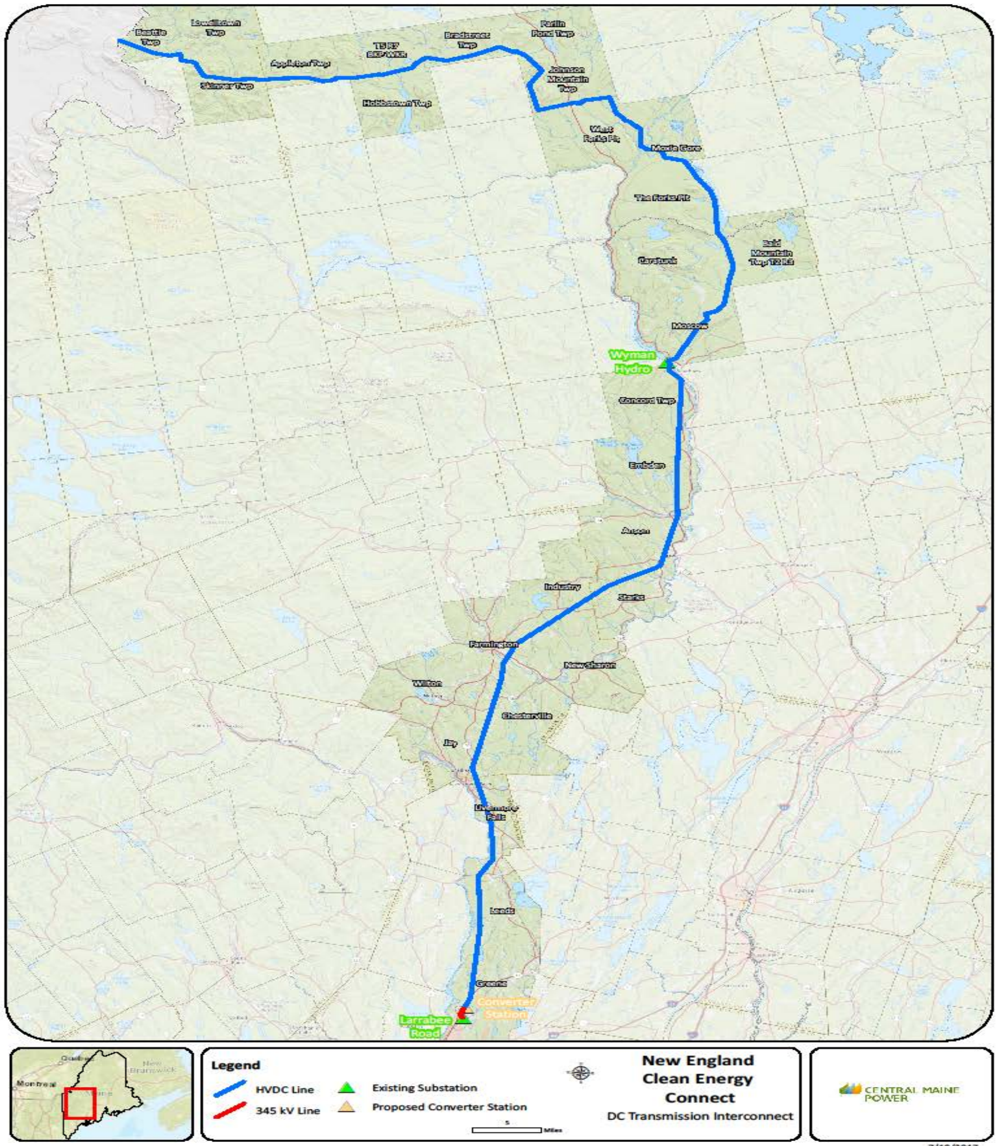
- New 145.3 mile +/-320 kV HVDC Transmission Line from the Canadian border to a new Converter Station located on Merrill Road in Lewiston;
- New 1.2 mile 345 kV Transmission Line from the new Merrill Road Converter Substation to the existing Larrabee Road Substation;
- Rebuild 0.8 mile of 34.5 kV Section 72 AC Transmission Line outside of the Larrabee Road Substation to make room in the corridor for the 1.2 mile 345 kV Transmission Line.

2.1.1.2. Substation Equipment:

- New 345 kV to +/-320 kV HVDC 1200MW Merrill Road Converter Substation;
- Add 345 kV Transmission Line Terminal at the existing Larrabee Road Substation.

The NECEC components up to the first interconnection with the ISO-NE power grid located in Maine are shown on the map in Figure 2-1 below and in Exhibit C.

Figure 2-1



2.1.2. Network Upgrades:

In addition, CMP will construct the following network upgrade facilities to permit the interconnection of the NECEC and facilitate the delivery of an incremental 1,200 MW of electric power to the New England Transmission System at the Larrabee Road Substation under the applicable ISO-NE interconnection standards and tariff provisions. These network upgrades are located beyond the first point of interconnection to the grid from the border crossing and therefore are not included in the facilities for which CMP requests a Presidential Permit. The MPUC, the Maine Department of Environmental Protection (MDEP) and other agencies will be responsible for the permitting of the network upgrades.

2.1.2.1. Transmission Line Equipment:

- New 26.5 mile 345 kV AC Transmission Line from the existing Coopers Mills Substation in Windsor to the existing Maine Yankee Substation in Wiscasset;
- New 0.3 mile 345 kV AC Transmission Line from the existing Surowiec Substation in Pownal to a new substation on Fickett Road in Pownal;
- Rebuilt 16.1 mile 115 kV Section 64 AC Transmission Line from the existing Larrabee Road Substation to the existing Surowiec Substation;
- Rebuilt 9.3 mile 115 kV Section 62 AC Transmission Line from the existing Crowley Road Substation in Sabattus to the existing Surowiec Substation;
- Partial rebuild of 1.0 mile each of 115 kV section 60/88 outside Coopers Mills Substation;
- Partial rebuild of 1.0 mile of 345 kV Section 392 between Coopers Mills Substation and Maine Yankee Substation; and
- Partial rebuild of 1.0 mile of 345 kV Section 3025 between Coopers Mills Substation and Larrabee Road Substation.

2.1.2.2. Substation Equipment:

- Replace existing Larrabee Road 345/115 kV 448MVA autotransformer with a 600MVA autotransformer;
- Add 345kV AC Transmission Line Terminal at the existing Maine Yankee Substation;
- Add 345kV AC Transmission Line Terminal and 115kV switch replacements at the existing Surowiec Substation;
- 115kV Switch and bus wire replacements at Crowley Substation;
- New 345kV Fickett Road Substation with 345kV +/-200MVAR Static Compressors (STATCOM);
- Add 345kV AC Transmission Line Terminal and additional 345kV +/-200MVAR STATCOM (+/-400MVAR total with the +/-200MVAR existing) at the existing Coopers Mills Substation; and
- Add 345/115kV 448MVA Autotransformer, associated 115kV buswork and terminate existing 115kV Sections 164, 164A, and165 at the existing Raven Farm Substation.

2.2. LOCATION, DESIGN, AND CONSTRUCTION METHODS

The following subsections describe the U.S. route segments analyzed in this Application and specific engineering details of the U.S. transmission facilities that comprise the NECEC in Maine, including: the overhead HVDC transmission line; the proposed HVDC converter station on Merrill Road in Lewiston, Maine, and the substation interconnection to the Larrabee Road Substation in Lewiston, Maine. The following subsections also discuss how CMP proposes to install and operate the transmission line and above ground facilities.

2.2.1. Description of Route Segments

2.2.1.1. HVDC line and 345 kV Interconnection Facilities - Québec – Maine border, Beattie Township to Larrabee Road Substation

The new HVDC line, including the border crossing segment, will extend from the Canadian border in western Maine approximately 145.3 miles to an interconnection point in Lewiston, Maine. The line will be located partially within undeveloped width of existing transmission corridors and partially within undeveloped corridor primarily traversing privately owned, industrial forest land.

CMP has control over the entire route of the NECEC. It owns in fee or holds easement rights for the entire corridor in which the new HVDC transmission line will run from the Québec-Maine border to the Merrill Road converter station, except for a single two acre parcel in northwest Maine, and holds a letter of intent to enter a long-term lease for this parcel. CMP also owns option rights for the location of the Merrill Road converter station and owns the Larrabee Road Substation in fee.

The corridor begins in western Maine in Beattie Township (Franklin County), Maine at CMP's identified border crossing, a point on the Canadian border approximately 2.5 miles north of the southwest corner of the township.[4] The corridor extends southeast for about 4.5 miles across Beattie Township, touches the southwest corner of Lowelltown Township and then extends easterly about 27 miles across Skinner Township, Appleton Township, Raytown Township, Hobbstown Township, Bradstreet Township, and across the southwest corner of Parlin Pond Township, (all in Somerset County). Elevations range from 2,400 feet in the west to 1,200 feet in Raytown Township. From Parlin Pond Township the corridor crosses onto Johnson Mountain Township extending southerly about 6.5 miles over the approach to Coburn Mountain and into the valley between Coburn Mountain and Johnson Mountain before turning east again for about 2.5 miles to the U.S. Route 201 crossing at a point about 40.5 miles from the Canadian border. Elevations on this segment range from just under 2,721 feet where the corridor crosses the Coburn ridge to about 1,400 feet at U.S. Route 201.

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[4] As noted above, the final location of the border crossing may change in consultation with HQT, but would be located within the range shown on the map provided as Exhibit D.

Between the border and U.S. Route 201 the corridor is a 300 foot wide parcel that is owned by CMP in fee with the exception of the two acre parcel in Lowelltown Township described below. The corridor has been surveyed but is not cleared. The surrounding land is generally industrial forest land typified by spruce-fir and northern hardwood forest types that are owned and managed for timber production. The area is undeveloped with only a few seasonal dwellings. Recreation is typically permitted on the industrial forest lands and there are some State-owned lands in the area. The Nature Conservancy has recently acquired a large parcel to the north of the corridor in Appleton Township and Raytown Township. There is one industrial wind farm located in Kibby Township which abuts Skinner Township on the south. There are no public roads or utilities until the corridor crosses U.S. Route 201, and access to the area is by private roads only. CMP has acquired permanent easement rights over these private roads as part of the corridor acquisition. U.S. Route 201 is a National Scenic Byway (known as the "Old Canada Road National Scenic Byway") in this area, and the corridor's alignment through Johnson Mountain Township was designed to minimize the view of NECEC's facilities from the highway.

The two acre, 300 foot wide by 300 foot long parcel in Lowelltown Township referenced above is owned in trust by the U.S. Government for the Passamaquoddy Tribe. CMP has a letter of intent with the Passamaquoddy Tribe to enter into a long term lease for such parcel and currently is negotiating the terms of this lease. CMP expects to enter into the lease with the Tribe by the third quarter of 2017. This lease will be subject to approval by the U.S. Department of the Interior, Bureau of Indian Affairs (BIA).

The corridor continues to be 300 feet wide east of U.S. Route 201, but the ownership is via easement for about 3.5 miles to a point where the corridor turns south and crosses about one mile of State-owned land situated on the town line between Johnson Mountain Township and West Forks Plantation. CMP leases the corridor across the State land under the terms of a 25 year lease that may be renewed indefinitely. CMP's fee ownership of the corridor resumes at the south line of the State land, and the 300 foot wide corridor continues south across West Forks Plantation about 4.75 miles to the Kennebec River and the Moxie Gore town line. Elevation ranges from about 1,400 feet near U.S. Route 201 to about 650 feet at the Kennebec River. Land uses in this segment are similar to the land uses between the Québec border and U.S. Route 201.

From the Kennebec River, the 300 foot wide fee owned corridor extends about 4 miles southeast across Moxie Gore and The Forks Plantation to the intersection with the existing transmission corridor (Section 222) near the Lake Moxie Road, the second public road crossed by the undeveloped section of the corridor. Elevation ranges from about 650 feet at the Kennebec River to about 1,000 feet. Moxie Gore was subdivided into 40 acre lots in the 1980s. Some of the lots are developed with seasonal dwellings and some have been acquired by a land trust; while the land type is similar to more northerly and westerly segments, the land use has thus changed to some extent.

Transmission line Section 222 is within a CMP fee-owned corridor acquired in the 1950s to connect Harris Dam on the Kennebec River (Indian Pond Project) with the transmission system at Wyman Dam (or Wyman Hydro), also on the Kennebec River. The corridor is improved with one overhead 115 kV transmission line and is 300 feet wide from the intersection with the new corridor to Wyman Dam, a distance of about 22 miles across the townships of The Forks Plantation, Bald Mountain Township, Caratunk and Moscow (all in Somerset County). Only one-half (150 feet) of the Section 222 corridor is cleared of all trees, leaving sufficient width in the remaining corridor for the new NECEC line. Elevation ranges from about 1,350 feet near the abandoned Moscow Air Force Radar Station to about 450 feet near Wyman Hydro.

The majority of the land abutting Section 222 is private industrial forest land. However, the first seven miles of this segment parallel the west shore of Moxie Pond, which includes a number of seasonal recreational dwellings. Section 222 crosses the Appalachian National Scenic Trail (AT or Appalachian Trail), a National Scenic Trail, at the south end of Moxie Pond, and the new line will cross the AT in the same location. Residential development increases as Section 222 nears the village of Moscow but remains sparse. Access to the Section 222 corridor is primarily by private roads over which CMP holds permanent easements. There are several public roads in the Town of Moscow, including U.S. Route 201.

Between Wyman Hydro in Moscow and Larrabee Road Substation in Lewiston, the new HVDC transmission line will be located in the fee owned 400 to 500 foot wide corridor acquired by CMP in 1930 to connect the Wyman Hydro project with the transmission system in Lewiston, Maine. From Wyman Hydro southerly for approximately 20 miles, the corridor is 500 feet wide and crosses the Towns of Concord, Embden, and Anson (Somerset County), and continues to the Madison Switch. The corridor is improved with a 115 kV transmission line (Section 63). The western 250 feet of the corridor is not cleared of all trees, and this corridor contains sufficient width for the new HVDC transmission line. The corridor width decreases to 400 feet at the south line of Anson and generally remains this width south to Lewiston. The western 150 feet of the corridor is not cleared of all trees, and the corridor contains sufficient width for the new HVDC transmission line.

Transmission line Section 279 begins at the Madison Switch and extends about .5 mile southwest in the Town of Starks (Somerset County) to the Starks Substation where the 115 kV line becomes Section 278. Section 278 extends approximately 26.5 miles southwesterly across the Towns of Starks, Industry, Farmington, Chesterville, Wilton, Jay and Livermore Falls (Franklin County) to the Livermore Falls Substation. The corridor contains Sections 251 and 200, which are both 115 kV transmission lines, beginning at Livermore Falls Substation and continuing about 23 miles across the Towns of Livermore Falls (Franklin County), Leeds, Greene and the City of Lewiston (Androscoggin County) to the Larrabee Road Substation. Again, the westerly 150 feet of the corridor is not cleared of tall trees and contains sufficient width for the new HVDC transmission line. Elevation ranges from about 300 feet to 721 feet along the corridor for this segment.

The corridor roughly parallels the Kennebec River between Concord Township and Starks, and then turns southwest until it begins to roughly parallel the Androscoggin River beginning in Jay and continues to follow the Androscoggin River into Lewiston. Land use along the corridor between Wyman Hydro and Larrabee Road Substation is mixed agriculture and woodlands with some industrial forest land along the northern segment and primarily private forest ownership further south. Most of the agricultural activity occurs on the outwash plains along the Kennebec, Sandy and Androscoggin rivers. The corridor comes close to the Village of North Anson and the Towns of Farmington and Jay/Livermore Falls where there is more residential development, but even in these areas development remains sparse. In the City of Lewiston, the Larrabee Road Substation is located in the northern part of the city in an area of mixed residential and rural use. Access to the corridor between Wyman Hydro and Larrabee Road Substation is generally from public roads. The corridor passes through State-owned land in the Town of Leeds that was acquired by the State long after the corridor was established.

The new 320 kV HVDC transmission line will terminate at the Merrill Road Converter Station, located about 1.2 miles north of the Larrabee Road Substation on a 20 acre site adjacent to CMP's existing 400 foot wide transmission line corridor. The site is heavily wooded and in a rural location with very few residences in the vicinity, the nearest being about 400 feet from the property line. A 345 kV line will connect the Merrill Road Converter Station with an existing bus at the Larrabee Road Substation, the first point of interconnection to the New England Transmission System. The Larrabee Road Substation was constructed as part of the MPRP, a major transmission project to improve the reliability of the New England Transmission System completed in 2015, on an approximately 80 acre site located on the northern outskirts of the City of Lewiston. A small stream located along the western side of the site makes placing the converter on the Larrabee Road Substation site impractical.

2.2.2. Project Components

2.2.2.1. HVDC Transmission Line

The 145.3 mile HVDC transmission line (Section 3006) will consist of bundled 1590 MCM Falcon ACSR conductor (2/DC pole), one 36 fiber Optical Ground Wire (0.602" DIA) and one 7 NO. 7 Alumoweld conductor (for shielding). The conductor will be supported by a mix of direct embedded and self-supporting steel single and double pole structures. Self-supporting structures will be set atop anchor bold cages on reinforced concrete drilled shaft foundations. All overhead transmission hardware, equipment, and structures will be provided and installed consistent with the applicable guidelines and recommendations, as appropriate, of the National Electric Safety Code (NESC), Institute of Electronics and Electronics Engineers (IEEE) , American National Standards Institute (ANSI), and the American Society of Civil Engineers (ASCE).

2.2.2.2. Merrill Road Converter Station

The Merrill Road Converter Station consists of the following major components:

345 kV Circuit Breakers: Circuit breakers are included in the converter station design primarily to prevent damage caused during a fault situation.

Converter Transformer: The converter transformer will provide the main voltage transformation for the converter station. It will also establish an auxiliary power source at the site.

Converter Valves: The Insulated Gate Bipolar Transistor (IGBT)/Converter Valves are the primary means of conversion of HVAC to HVDC (and vice versa). These valves provide high speed switching that makes the process of conversion possible.

Reactors: The converter station design includes various reactors for the purpose of allowing the control of active and reactive power and limitation of short circuit/transient currents.

Capacitors: Capacitors are used both across the DC poles and within the IGBT converter modules themselves. They perform a variety of functions including energy storage and filtering.

Disconnect Switches: A variety of disconnect switches will be used in conjunction with circuit breakers to facilitate maintenance and construction of the converter station. Disconnect switches are used primarily as means to isolate electrical equipment and create a visual opening to aid in work being done in the station.

Instrument Transformers: Instrument transformers will be used to supply measurements of voltages and currents to control protective relaying and metering cubicles in the converter station.

Overhead Shield Wires: A variety of typical overhead shield wires will be used to provide lightning protection for improved reliability.

Insulators: A variety of high strength and extra high strength station post insulators will be used as required by design.

Surge Arrestors: A variety of surge arrestors are included in the converter station design to clamp the voltage within acceptable levels to prevent damage to major equipment.

Inrush Resistors: Inrush resistors are included in the converter station design to reduce transients and system impacts of initial energization of the DC converter system.

Support Systems/Components: The converter station will include necessary cooling systems, auxiliary AC/DC sources, and control and protection systems.

2.2.2.3. 345 kV Line from Merrill Road Converter Station to Larrabee Road Substation

The 1.2 mile 345 kV transmission line connecting the Merrill Road Converter Station to the existing Larrabee Road Substation (Section 3007) will consist of bundled 1590 MCM Falcon ACSR conductor (2/AC phase), one 36 fiber Optical Ground Wire (0.602” DIA) and one 7 NO. 7 Alumoweld conductor (for shielding). The conductor will be supported primarily by wood framed structures in a two pole H-frame configuration. Based on the final detailed design requirements, CMP also may use steel, round and laminated wood structures that may be direct embedded or self-supporting on foundations.

CMP will also rebuild the existing 34.5 kV Section 72 for approximately 0.8 mile just outside of the existing Larrabee Road Substation. This rebuild will clear space in the corridor to allow for the new 345 kV Section 3007 line between the Merrill Road Converter Station and Larrabee Road Substation. The 0.8 mile 34.5 kV transmission lines will consist of single 477 MCM Pelican ACSR conductor (1/AC phase), one 36 fiber Optical Ground Wire (0.602" DIA) (for shielding). The conductor will be supported primary by wood pole structures in a monopole configuration.

2.2.2.4. Larrabee Road Line Terminal

The AC interconnection facilities will consist of a 345 kV line terminal expansion at the existing Larrabee Road Substation. The terminal expansion will require the addition of a 345 kV line termination structure, a 345 kV circuit breaker, disconnect switches, instrument transformers, surge arrestors, buswork modifications, support structures, foundations and modifications to the existing protection and control system. Some network upgrades will occur at the Larrabee Road Substation. CMP also will replace the existing T1 transformer at the Larrabee Road Substation with a unit with a nameplate rating of 600MVA (from 448MVA) to mitigate thermal overloads under contingency conditions.

2.2.3. Staging Areas

The NECEC will require staging areas along the route. The location and securing of staging areas typically occurs once the transmission line design is sufficiently advanced so that the staging areas can be strategically located to maximize construction efficiency. Also, staging areas that are located outside the existing corridor are typically secured by short-term agreements due to the temporary period of use. CMP has sufficient additional width on both the new and existing corridor portions of the project to accommodate small to moderate size staging areas within the existing fee ownership. Larger areas will be secured with a focus on utilizing existing open areas such as log landings and gravel extraction areas, both of which are common in the forested areas that abut much of the corridor.

2.2.4. Upgrade Facilities

To permit the interconnection of the NECEC to the New England Transmission System under the applicable ISO-NE standards and tariff provisions, certain upgrades are needed to the existing AC transmission system in Maine. These upgrade facilities are described herein solely to provide DOE with a complete picture of the project, including facilities that are not subject to the Presidential Permit.

2.2.4.1. 345 kV Line - Coopers Mills Road Substation, Windsor, Maine to Maine Yankee Substation, Wiscasset, Maine

CMP will construct a new 345 kV transmission line between the existing Coopers Mills Road and Maine Yankee Substations. The new 345 kV line will be located in an existing 26.5 mile long primarily fee owned corridor that includes Section 392, a 345 kV line. To connect the new 345 kV line between the Coopers Mills Road and Maine Yankee Substations, a 345 kV line terminal expansion will be necessary at the existing Maine Yankee Substation. This upgrade will require the addition of 345 kV line termination structures, 345 kV circuit breakers, disconnect switches, instrument transformers, surge arrestors, buswork modifications, support structures, foundations and modifications to the existing protection and control system. In addition it will require reconfiguration of the existing 345 kV lines to accommodate the new Section 3027 345 kV line. All proposed substation upgrades will be within the existing substation yard.

The new 345 kV line between the Coopers Mills Road and Maine Yankee Substations will also require a 345 kV line terminal expansion at the existing Coopers Mills Road Substation. This expansion will require the addition of 345 kV line termination structure, 345 kV circuit breakers, disconnect switches, instrument transformers, surge arrestors, buswork modifications, support structures, foundations and modifications to the existing protection and control system. In addition it will require reconfiguration of the existing 345 kV lines to accommodate the new Section 3027 345 kV line. The NECEC project also requires the addition of a +/-200MVAR STATCOM at the Coopers Mills Road Substation to provide dynamic reactive support (+/-400MVAR total with the existing +/-200MVAR currently under construction). The STATCOM expansion will be constructed with similar major components as the HVDC converter arranged in a different electrical configuration to provide system reactive support instead of real power transfer capability. All proposed substation upgrades will be within the existing substation yard.

CMP will rebuild existing Sections 60 and 88 for approximately 0.3 miles each just outside of the existing Coopers Mills Road Substation. This rebuild will clear space in the corridor to allow for new 345kV Section 3027 line between Maine Yankee Substation and Coopers Mills Road Substation. The 0.3 mile 115kV transmission lines will consist of single 1113 MCM Falcon ACSR conductor (1/AC phase), one 36 fiber Optical Ground Wire (0.602" DIA) and one 7 NO. 7 Alumoweld conductor (for shielding). The conductor will be supported primary by wood pole structures in a monopole configuration.

2.2.4.2. 115 kV Rebuilds - Larrabee Road Substation and Crowley Road Substation to Surowiec Substation

CMP also will rebuild a 16.1 mile long 115 kV Section 64 AC transmission line in the corridor between the existing Larrabee Road Substation and Surowiec Substation as well as a 9.3 mile 115 kV Section 62 AC transmission line from the existing Crowley Substation in Sabattus, Maine to the existing Surowiec Substation. The 16.1 and 9.3 mile rebuilds of Section 64 and 62 will consist of a single 1590 MCM Falcon ACSR conductor (1/AC phase) and one 36 fiber Optical Ground Wire (0.602" DIA) (for shielding). The conductor will be supported primary by wood framed structures in a single pole configuration. Based on the final detailed design requirements, CMP also may use steel, round and laminated wood structures that may be direct embedded or self-supporting on foundations. As part of these rebuilds, the existing H-frame structures will be replaced with single pole structures to maximize available space within the corridor. In addition CMP will perform terminal upgrade work at Surowiec and Crowley Road Substation to existing switches, and buswork to facilitate the new line ratings.

2.2.4.1. 200MVAR 345 kV STATCOM – Fickett Road Substation

To facilitate the new STATCOM, CMP will add a 345 kV line terminal at the existing Surowiec Substation. This expansion will require the addition of 345 kV line termination structure, 345 kV circuit breakers, disconnect switches, instrument transformers, surge arrestors, buswork modifications, support structures, foundations and modifications to the existing protection and control system. Given space constraints and a nearby stream around the existing substation CMP will establish a new substation yard across the road from Surowiec (named Fickett Road Substation) that will house the +/-200MVAR STATCOM device. In addition the proposed Fickett Road Substation also will include: a 345 kV line termination structure, 345 kV circuit breakers, disconnect switches, instrument transformers, surge arrestors, associated buswork, support structures, foundations and the required protection and control systems. The STATCOM will be constructed with similar major components as the HVDC converter arranged in a different electrical configuration to provide system reactive support instead of real power transfer capability. The line terminal expansion at Surowiec Substation will be built within the existing yard.

2.2.4.2. 345 kV Line – Surowiec Substation to Fickett Road Substation

CMP will construct a new 0.3 mile 345 kV AC transmission line from the existing Surowiec Substation in Pownal, Maine to a new Fickett Road Substation in Pownal, Maine. The 0.3 mile 345 kV transmission line will consist of bundled 1590 MCM Falcon ACSR conductor (2/AC phase), one 36 fiber Optical Ground Wire (0.602" DIA) and one 7 NO. 7 Alumoweld conductor (for shielding). The conductor will be supported primary by wood framed structures in a two pole H-frame configuration. Based on the final detailed design requirements, CMP also may use steel, round and laminated wood structures that may be direct embedded or self-supporting on foundations.

2.2.4.1. 345/115 kV Transformer Addition- Raven Farm Substation

CMP will add a 345/115 kV 448MVA auto-transformer and a breaker and one half 115 kV bus at the existing Raven Farm Substation. This substation expansion will sectionalize the existing 115 kV Section 164, 165, and terminate the existing 164A tap into the substation.

2.2.5. Operation and Maintenance

CMP will own all NECEC transmission facilities in Maine and will be responsible for operating and maintaining these facilities when they are in-service in accordance with a standard Transmission Operating Agreement to be entered with ISO-NE. CMP is Maine's largest transmission and distribution utility and operates and maintains its own, existing transmission system. This entails operating and maintaining over 569 miles of 345 kV transmission lines, 1,258 miles of 115 kV transmission lines and 254 substations. CMP operates the local control/operations center for the Maine transmission system administered by ISO-NE from its General Office in Augusta, Maine. This control center is staffed by a minimum of two employees on an around-the-clock basis. In addition, CMP employs approximately 235 line workers and 50 substation technicians throughout its service territory and, as needed, retains contractors for replacement of equipment CMP determines to be necessary under its transmission inspection program. CMP plans to use these crews to operate and maintain the NECEC transmission facilities in Maine.

Prior to being put in service, the NECEC transmission and substation facilities and equipment will be tested in accordance with best utility practice and the standards of the InterNational Electrical Testing Association (NETA). All equipment and circuitry for protection, control, Supervisory Control and Data Acquisition (SCADA)/Remote Terminal Units (RTU), metering, and Digital Fault Recording (DFR) will be fully tested to ensure compliance with system design prior to energizing the facility. Communications-assisted tripping schemes also will be fully tested and verified to comply with system design prior to energizing. ISO-NE and the local control/operations center will be made aware of and approve any new equipment being connected to the system per their scheduling requirements. CMP will make available personnel to facilitate proper compliance with energizing sequencing and planning. Equipment will be checked dielectrically safe (soaked) with primary rated voltage prior to passing system load. After confirming that all instrument transformers are within specified accuracy tolerances, the equipment will be fully tested with load to prove all metering, signaling, and protective relaying with primary voltage/current contributions to and from each applicable device.

Upon being put in service, CMP will operate (under ISO-NE's direction and control) and maintain the NECEC transmission facilities as integral parts of its existing transmission system and in accordance with the operating and maintenance (O&M) best practices CMP currently uses for its transmission systems. As Maine's largest transmission and distribution utility, CMP has O&M personnel on staff and, as noted above, will use those crews for the NECEC. Contractors are primarily utilized for replacement of equipment. In addition, as needs arise, CMP periodically retains outside contractor crews to supplement its in-house crews. In the case of the newer technologies proposed in this project (*i.e.*, the STATCOM and HVDC Converter) CMP will work with the awarded vendor and follow the recommended maintenance practices for the equipment. CMP plans to use its own crews for most of the work on this equipment, initially under the direction of the vendor's experts to obtain training and eventually completely on its own. CMP will have ongoing contracts with the vendors to support emergent O&M requests to ensure that outage durations are minimized.

The transmission facilities that make up the NECEC are expected to have a useful life of at least 40 years and with normal maintenance are not expected to require major equipment overhauls over this useful life. There are projected overhauls of associated relays/protection and control equipment in year 20 of operation, but CMP plans to sequence this maintenance work to avoid outages. Maintenance outages for transmission lines themselves are rare and are typically scheduled during low load periods when the full capability of the transmission network is not required. Additionally, transmission outages are, to the extent practicable, coordinated with generators likely to be affected by such outages. In this way, transmission outages are scheduled during generation plant planned outages, if possible. The typical availability rate of high voltage transmission on the CMP system, taking into account both scheduled and unscheduled outages, is in excess of 99 percent.

CMP's general practice for maintenance and inspection of major substation equipment is as follows:

- **Circuit Breakers**: Trip checks every two years, out of service inspection every six years for SF6 breakers.
- **Power Transformers**: In service maintenance every six months for 345 kV units, out of service inspection/testing every four to eight years depending on LTC type.
- **Relay Testing**: All relays and associated protective equipment will be tested every two years.
- **Thermal Inspections**: Substation thermal inspections are completed every summer and winter each year.
- **Batteries**: All substation batteries are tested annually.
- **General Station Inspections**: Visual inspections of all substations bi-monthly.

CMP's general practices for maintenance and inspection of transmission lines are as follows:

- **Groundline Inspection:** Transmission poles 18 inches below ground to approximately six feet above ground, all transmission voltages; inspect and treat 10 year cycle; poles identified as a fair rating are inspected every five years under the mid-cycle inspection cycle. This inspection determines a rating of good, fair, reject, or danger for the pole.
- **Crossarm Inspection**: A detailed inspection of the poles from six feet above ground to the top of the structure including probing the crossarm to determine depth of rot. This documents woodpecker damage for follow-up repair. Inspections performed on a ten year cycle for all transmission voltages. The sections inspected in a calendar year match the groundline sections. Arms and structures identified as a fair rating are inspected every five years

under the mid-cycle inspection cycle. This inspection determines a rating of good, fair, reject, or danger for the arm(s) or structure.

- **345 kV Foot Patrol:** This is a visual inspection completed annually on the 345 kV system in Maine. The documentation of woodpecker damage, large cracks in poles or arms, insulator damage, repair of down grounds that are broken or any other issue identified that needs to be corrected.
- **Helicopter inspection**: The complete transmission system (all voltages) in the CMP's service area is visually inspected by helicopter in a spring patrol and again in a fall patrol. The radial sections are also patrolled in a summer helicopter inspection.
- **Transmission Infrared**: Transmission infrared inspections are conducted on a four year cycle for all transmission voltages. This is completed with the summer inspection of the radial transmission lines.

2.3. TECHNICAL DESCRIPTION

The NECEC is technically viable and is based on commercially available and proven technology. The HVDC components of the project will use Voltage Sourced Converter (VSC) technology. HVDC-VSC technology is available from several global vendors including ABB and Siemens and offers significant technological benefits, including:

- Independent linear control of active and reactive power flows;
- Capability to operating under unsymmetrical network AC voltages (*e.g.*, during AC network faults) and the capability to contribute to compensating unsymmetrical loads, such imbalanced operation during AC system faults or compensation of external imbalances;
- Capability to contribute to the short circuit current if needed and to serve as a firewall for limiting the spread of system disturbances;
- Robust response during AC grid faults with continuity of power transmission and reduced disturbance propagation;
- DC fault ride-through capability;
- High dynamic performance;
- Restarting of blacked-out grids and re-energizing them (black-start capability);
- HVDC-VSC is fully suitable for long-distance-transmission with DC overhead lines; and
- HVDC-VSC can be integrated into HVDC multi-terminal systems or future HVDC grids.

In addition, HVDC-VSC technology provides a straightforward AC side connection, and the converter modules are operated with a low switching frequency, resulting in low converter losses and lower operational costs.

The converter and the control equipment are also designed with a high level of component redundancy for extremely high reliability.

2.3.1. Number of Circuits

The new 320 kV HVDC line from the Québec-Maine border to the Merrill Road Converter Station will operate with two conductors (+/-) forming one circuit.

2.3.2. Operating Voltage and Frequency

The proposed line from the border will operate at DC and +/-320kV. The proposed 1.2 mile AC line from the Merrill Road Converter Station to the Larrabee Road Substation will operate at 60Hz and 345 kV.

2.3.3. Conductor Size, Type, and Number of Conductors per Phase

Overhead electrical conductor sizes and types are provided in Section 2.2.2.1 above.

2.3.4. Wind and Ice Loading Design Parameters

Transmission line design parameters for the proposed projects lines will be based on NESC Rule 250B Heavy Loading District as follows:

- Extreme Wind (3 sec Gust): 95 mph
- Extreme Wind Temperature: 40°F
- Extreme Ice: 1.5 Inch Radial Ice
- Extreme Ice Plus Wind at 15°F: 1 Inch Radial Ice w/ Concurrent 40 mph Wind
- Extreme Low Ambient Temperature: -40°F
- Average Annual Minimum Temperature Limit for Vibration Control: -25°F

2.3.5. Description and Drawing of Typical Supporting Structures,

The typical supporting structures are described in Section 2.2.2.1 above. Drawings of the typical support structure configurations are attached at Exhibit B.

2.3.6. Structure Spacing with Typical Ruling and Maximum Spans

The structure spacing assumed for the various transmission line designs are as follows:

Line Design	Typical Spacing (feet)	Maximum Spacing (feet)
+/-320kVDC lines	800	1000
345kVAC Lines	800	1000
115kVAC Lines	500	800

*Exceptions to maximum span length may occur in certain circumstances.

2.3.7. Conductor (Phase) Spacing

The phase spacing assumed for the various transmission line designs are as follows:

Line Design	Spacing (feet)
+/-320kVDC lines	39
345kVAC Lines	26
115kVAC Lines	13

2.3.8. Designed Line to Ground and Conductor Site Clearances

The line to ground clearances assumed for the various transmission line designs are as follows:

Line Design	Clearance (feet)
+/-320kVDC lines	34
345kVAC Lines	32
115kVAC Lines	25

2.4. CONSTRUCTION AND PERMIT SCHEDULE

The initial permitting phase of the NECEC is expected to continue through 2017 into early 2019 (see Section 5 for additional information on regulatory approvals required). Construction-related activities are expected to commence in 2019 and continue through 2022. CMP anticipates that the commercial operation date for the NECEC will be in 2022.

2.5. GENERAL AREA MAPS AND BORDER MAP

Detailed maps showing the project route and surrounding areas are attached as Exhibit C. A map showing alternative routes also is included in Exhibit C. A detailed map showing the area for potential location of the border crossing is attached as Exhibit D.

2.6. BULK POWER SYSTEM INFORMATION

Pursuant to the requirements of 10 C.F.R. § 205.322(b)(3), CMP provides the following bulk power supply information for the NECEC.

2.6.1. Expected Power Transfer Capability Using Normal and Short Time Emergency Conductor Ratings

The proposed maximum power transfer capability of the HVDC line from the border to the Merrill Road Converter Station is 1,200 MW. In general, the power transfer capability of this line is limited by the maximum thermal capacity of the proposed converter station and the temperature sag profile of the transmission line. Ratings information has been provided below for reference.

CMP rates all transmission components in accordance with ISO-NE Planning Procedure 7 (PP7) Guidelines. In general this system has eight ratings, a summer and a winter version of the following:

- Normal- Normal is a continuous rating.
- Long Time Emergency (LTE)- LTE is a 12 hour summer rating and 4 hour winter rating.
- Short Time Emergency (STE)-STE is a 15 minute rating.
- Drastic Action Limit (DAL)- DAL is a 5 minute rating.

Based on the system described above, the ratings for the various line segments of the Project are provided below (all ratings values provided in MVA):

Table 2-1 Line Segment Summer Ratings (MVA)

NECEC

Line Segment	Voltage	SNORM	SLTE	SSTE	SDAL
3006	+/-320 kV DC	1200	TBD[5]	TBD	TBD
3007	345 kV AC	2151	2479	2805	3668

Network Upgrades

Line Segment	Voltage	SNORM	SLTE	SSTE	SDAL
3005	345 kV AC	2151	2479	2805	3668
3027	345 kV AC	2151	2479	2805	3668

Table 2-2 Line Segment Winter Ratings (MVA)

NECEC

Line Segment	Voltage	WNORM	WLTE	WSTE	WDAL
3006	+/-320 kV DC	TBD	TBD	TBD	TBD
3007	345 kV AC	2626	2875	3309	4392

Network Upgrades

Line Segment	Voltage	WNORM	WLTE	WSTE	WDAL
3005	345 kV AC	2626	2875	3309	4392
3027	345 kV AC	2626	2875	3309	4392

[5] When CMP chooses a vendor for the converter and completes detailed design for the HVDC transmission line, the overload capability listed as TBD (to be determined) in Tables 2-1, 2-2, 2-3, and 2-4 will be calculated.

CMP sized the proposed conductors based on a variety of factors including thermal rating, sound, corona, losses, etc. In the cases of the +/-320 kV DC line and the 345 kV AC line, CMP anticipates that transfers over the various segments will be thermally limited by the converter station/terminals respectively, as such this data is provided below:

Table 2-3 NECEC Line Terminal Summer Ratings (MVA)

Voltage	SNORM	SLTE	SSTE	SDAL
320kV DC	1200*	TBD	TBD	TBD
345 kV AC	1970	2108	2151	2151

Table 2-4 NECEC Line Terminal Winter Ratings (MVA)

Voltage	WNORM	WLTE	WSTE	WDAL
320 kV DC	1200*	TBD	TBD	TBD
345 kV AC	2213	2401	2402	2402

* Ratings provided for receiving end converter at Merrill Road and will be at least 1,200 MW.

The northern converter located in Québec will have a higher rating to account for losses between the two points. The HVDC line will be designed to be clearance limited (due to large conductor size to minimize losses) to the operating temperature of the line at the 1,200 MW transfer level of the link in the summer. This will naturally provide some additional line transfer capability in the winter (value to be calculated later) months, but again the expectation is that the overall DC link capability will be converter limited.

2.6.2. System Power Flow Plots

DOE's regulations at 10 C.F.R. § 205.322(b)(3)(ii) require CMP to provide system power flow plots for its proposed service areas for 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. CMP's system power flow plots are attached as Exhibit E.[6]

[6] Exhibit E contains Critical Energy Infrastructure Information (CEII) and is redacted from the public version of this Application. It is included in the non-public version of the Application submitted to the DOE.

2.6.3. Television, Radio, and Cellular Telephone Interference Reduction Data

The proposed HVDC technology and transmission cable will be designed to eliminate any potential electromagnetic interference (EMI) that could affect television or radio service along the transmission line corridor. The Merrill Road Converter Station will be designed to meet the requirements of local radio, television, and telephone EMI limits. The facility also will comply with the limits stated in CISPR 11 (Industrial, Scientific, and Medical (ISM) Radio Frequency Equipment—Electromagnetic Disturbance Characteristics—Limits and Methods of Measurement), Group 1 and Class A, in the frequency range of 30 MHz–1 gigahertz (GHz). The corona noise level (caused by the local sound-pressure level changes due to the individual corona discharges) from the outdoor yard at the Merrill Road Converter Station will not exceed 100 microvolts per meter (μV/m) in the frequency range of 500 kHz to 30 MHz within a 1,475 foot (450 meter) perimeter, as measured from any energized component in the Merrill Road Converter Station.

Additional details regarding the features required to minimize EMI at the Merrill Road Converter Station will be developed during the detailed design phase of the NECEC.

2.6.4. Description of Relay Protection Scheme, Including Equipment and Proposed Functional Devices

The relay protection scheme for the NECEC will be designed pursuant to the manufacturer's protection solutions for DC lines, with an appropriate level of redundancy. Protection strategies for DC lines are different than those for AC lines, which are typically protected pursuant to Northeast Power Coordinating Council (NPCC) requirements. In VSC HVDC systems, a quicker fault clearance method is expected. Protection systems that are based on communications between the two ends of the line (as required by NPCC) do not guarantee this needed fast response, and other methods that do not require communications are normally used, including travelling wave principle, overcurrent protection, and artificial intelligence. Telecommunications aided protection schemes can still be used, but more as backup systems.

2.6.5. System Reliability and Stability Analysis

The NECEC is expected to provide significant reliability and stability benefits to the New England region. ISO-NE has not yet completed a system impact study with respect to the NECEC and no interconnection agreement has been executed. The project is in the ISO-NE Generation Queue as Queue #639. The System Impact Study (SIS) is currently pending at ISO-NE, and CMP expects the SIS to be completed in time to permit ISO-NE's issuance of I.3.9 approval for the NECEC by the first quarter of 2019. However, CMP's transmission planning group has completed a system impact study that approximates the ISO-NE interconnection process, including stability analysis, for the NECEC and found that the project as proposed satisfies the applicable interconnection requirements under the ISO-

NE Open Access Transmission Tariff (OATT). The parameters and results of CMP's system impact study are included in the Technical Report attached as Exhibit K.[7]

The NECEC is designed to ensure the interconnection and delivery of up to 1,200 MW of generation to the New England Control Area at the existing Larrabee Road Substation in accordance with the Capacity Capability Interconnection Standard (CCIS) in the ISO-NE OATT. This generation will be firm throughout the year. On a daily basis, this means that the NECEC will deliver upwards of 24,000 MWh of firm clean energy to the New England Control Area. These energy deliveries will reduce any future winter electricity price spikes resulting from natural gas shortages or price spikes in New England.

CMP ensures the delivery of up to 1,200 MW of capacity and energy from the NECEC at the existing Larrabee Road Substation by constructing all necessary transmission upgrades to satisfy the CCIS under appropriate planning assumptions and at the same time to increase the transfer limits at the existing Surowiec South interface in Maine. The Surowiec South interface is a stability limited interface in central Maine, which, with the addition of the NECEC project, would require an increase to its transfer limit in order to allow the Clean Energy Generation transported on NECEC to become fully deliverable to New England. By including the identified AC network upgrades (which are not part of the Project to be considered by DOE for purposes of this Application) and STATCOM devices, the stability limits at the Surowiec South interface will increase from 1,600 MW to 2,600 MW, an increase of 1,000 MW. Additionally, the transfer limit analyses CMP has performed show this new limit will not be thermally constrained at 2,600 MW. This transfer limit increase will provide enhanced reliability to the New England Control Area by permitting additional power flows from western and northern Maine onto and across the existing 345 kV transmission system in Maine.

CMP is confident that these transfer limit increases and related reliability benefits will be realized based on the system impact studies completed to date for the NECEC, which are provided in the Technical Report submitted as Exhibit K. As set forth in the Technical Report, the NECEC meets the requirements for interconnection under Section I.3.9 of the ISO-NE OATT because it does not cause any adverse impact to the New England transmission system with all the transmission upgrades included, as seen through the steady-state and stability testing performed, and in fact improves the reliability and performance of the New England Transmission System by increasing the transfer limits at the Surowiec South Interface.

CMP also performed studies in accordance with the CCIS, known as the overlapping impact analysis, by reflecting the interconnection of the NECEC directly into the Larrabee Road Substation, and by completing the planning studies without dispatching existing generation offline to allow for this interconnection.[8] The overlapping impact analysis is

[7] Exhibit K contains CEII and is redacted from the public version of this Application. It is included in the non-public version of the Application submitted to the DOE.
[8] As discussed in Exhibit K, the injection of the NECEC Clean Energy Generation at the Larrabee Road delivery point is expected to change the actual economic dispatch of existing generation in New England by displacing

included in non-public (CEII) Exhibit K. Unlike the Minimum Interconnection Standard (MIS) under the ISO-NE OATT, which allows other generation to be dispatched off to permit the interconnection of the proposed new resources, under the terms of Planning Procedure (PP) 10 the more stressful overlapping impact analysis requires that new generation be fully deliverable to a Control Area (in this case, the State of Maine), without dispatching off existing generation within the same zone of interconnection.

In addition, the NECEC system impact studies were prepared in a manner that is consistent with how ISO-NE currently is performing its Maine Resource Integration Study (MRIS), which is assessing the transmission upgrades needed to inject up to 1,200 MW of generation in western Maine. Because of the technical similarities and significant stakeholder input into the study parameters used by ISO-NE, CMP has used ISO-NE's MRIS as a base line for comparison for the NECEC. As set forth in Exhibit K, the NECEC-related studies use similar stresses and dispatch cases to demonstrate the interconnection and capacity qualification for the NECEC Clean Energy Generation. Posted on February 7, 2017, the MRIS is available on the ISO-NE website at: https://smd.iso-ne.com/operations-services/ceii/pac/2017/02/a6_maine_resource_integration_study.pdf. Updated results for MRIS (posted on May 24, 2017) can also be found at: https://smd.iso-ne.com/operations-services/ceii/pac/2017/05/a2_maine_resource_integration_study_results.pdf.

SECTION 3 INFORMATION REGARDING ENVIRONMENTAL IMPACTS

3.1. INTRODUCTION

This section describes the existing environment within the project area as well as the potential environmental impacts and mitigation measures associated with constructing and operating the NECEC.

The NECEC is designed to avoid and minimize environmental impacts and to provide significant greenhouse gas (GHG) reduction benefits to the northeast region. These critical environmental attributes promise to maximize stakeholder support and minimize stakeholder opposition, and will facilitate timely permitting at the federal, state and local levels.

3.1.1. Minimal environmental impacts

Based on its extensive experience, CMP understands that siting a transmission project to minimize impacts on the environment and neighboring landowners is critical to the project's success. Accordingly, CMP and its real estate and environmental professionals have identified and secured necessary rights for a route that to the maximum extent

more costly and less efficient fossil-fuel fired generation, including generation north of Larrabee Road, but any such dispatch changes will not arise because of transmission constraints arising from the NECEC, which is designed to comply with both Section I.3.9 and the CCIS in the ISO-NE Tariff.

practicable (i) uses existing transmission corridors and (ii) avoids environmentally sensitive areas and resources. These efforts have been successful, as approximately 64% of the NECEC components will be constructed within or immediately adjacent to existing transmission corridors owned by CMP, thereby minimizing impacts to existing land uses as well as the environment, with the remainder of the route located almost entirely in privately owned, industrial forest land, which is periodically harvested for wood products. The NECEC route does not cross any protected lands, *i.e.*, lands subject to conservation easements or other conservation-related land use restrictions, such as state or national forests.

To further minimize the impacts of the project, CMP, through its environmental and design professionals, is actively coordinating with state and federal natural resource and wildlife agencies to identify and minimize impacts to sensitive habitats and wildlife species. CMP and its consultants also have developed, in cooperation with state and federal environmental regulators (the MDEP and the United States Army Corps of Engineers (USACE)), construction performance standards to avoid and minimize disturbances and impacts to the natural environment and will maintain any newly cleared transmission line corridor as early successional (scrub-shrub or meadow habitat). These steps represent best practices and have already fostered a strong and collaborative relationship between CMP and the environmental regulators with respect to the Project.

3.1.2. Permitting progress and expectations

All of the above provides CMP confidence that it will obtain all environmental permits needed for the NECEC in a timely fashion consistent with the schedule provided as Exhibit J. To date, CMP has completed pre-application meetings with the DOE, MDEP, and USACE, and has held meetings with other state and federal natural resource agencies to discuss resource issues and studies in support of state and federal permit applications. CMP plans to submit the MDEP and USACE permit applications in mid-September, 2017 and anticipates an acceptance (complete for processing) determination from MDEP by early October, 2017.

The MDEP and the USACE Maine Project Office, as the primary permitting agencies in Maine, have considerable recent experience with permitting similar large transmission projects in the state, including most notably, MPRP, which CMP successfully permitted on schedule in 2010. The MDEP and USACE have indicated they will work closely with CMP's permitting team with respect to the NECEC's permit applications, which present no new issues that CMP has not previously encountered and successfully addressed in the course of MPRP permitting. CMP's MDEP and USACE applications will address and comply with all applicable approval standards, and will reflect the permitting team's considerable experience permitting similar large and complex transmission projects in Maine, particularly the MPRP.

3.2. ASSESSMENT OF ENVIRONMENTAL IMPACTS

CMP has conducted preliminary assessments of the preferred route and alternatives and continues to evaluate the NECEC's potential environmental impacts on natural and cultural resources through ongoing consultation with state and federal regulatory agencies, federally recognized Native American tribes and other stakeholders. To perform this preliminary assessment, CMP reviewed publicly available geospatial data, performed initial resource surveys and studies, and evaluated information provided by regulatory agencies.

Surveys of protected and sensitive natural resources (*e.g.*, wetlands, water bodies, vernal pools) for the transmission line components of the Project and associated substation and converter station sites are complete. In addition, studies assessing the potential impacts resulting from noise, scenic and aesthetic impacts, cultural resources, stormwater, and groundwater, are underway. CMP continues to consult with appropriate Federal and State agencies regarding significant wildlife habitats and potential rare, threatened and endangered (RTE) species and habitats that may be located in or adjacent to the transmission corridor. A list of agency contacts is attached at Exhibit Q.

The NECEC will result in both temporary and permanent environmental impacts associated with transmission line, converter station and substation development. Impacts may include placing temporary fill (*i.e.*, equipment mats) in wetlands during construction, and placing permanent fill (*i.e.*, substation pads, access roads and transmission pole structures) in wetlands, converting forested wetlands to shrub/early successional habitat, and clearing tall woody growth from wildlife habitat, including vernal pools and deer wintering areas. During the transmission line detailed design process, CMP will continue to work with its environmental consultants, design and siting engineers, and appropriate agencies to avoid and minimize environmental impacts to the greatest extent practicable, and to mitigate unavoidable impacts.

The NECEC's preferred route is the result of extensive analysis of siting alternatives with a primary evaluation criterion being avoidance of impacts to sensitive and protected natural resources. This was accomplished by avoiding, to the extent practicable, conserved lands, stream crossings, wetlands, deer wintering areas, and inland waterfowl and wading bird habitat, and maximizing use of existing transmission line corridors. Where unavoidable impacts exist, the Project is designed and located, and will be constructed, to minimize and mitigate those impacts.

CMP will compensate for natural resource impacts that cannot be avoided. A project-specific compensation plan will be developed to offset unavoidable impacts to protected natural resources. This plan will be developed in consultation with natural resource agencies including MDEP, USACE, U.S. Fish and Wildlife Service (USFWS), and the Maine Department of Inland Fisheries and Wildlife (MDIFW), among others. This compensation plan may include: an in-lieu fee contribution to the Maine Natural Resources Conservation Fund (to be made available for grant awards to qualified natural resource conservation projects); preservation, enhancement, or restoration of protected and sensitive natural resources and areas; or a combination of these actions.

The following discussion describes generally how impacts will be avoided, minimized, and/or mitigated.

3.2.1. Wetlands

Wetlands generally include "swamps, marshes, bogs, and similar areas" (USACE Wetlands Delineation Manual, 1987). The USACE regulates wetlands under Section 404 of the Clean Water Act (CWA), and by the MDEP under the Natural Resources Protection Act (NRPA), 38 M.R.S. §§ 480-A, *et seq.*

The MDEP's NRPA rules govern activities in or adjacent to coastal wetlands, freshwater wetlands, great ponds (generally natural waterbodies with an area greater than 10 acres and manmade waterbodies with an area greater than 30 acres), rivers, streams, and brooks. The MDEP rules establish six types of freshwater wetlands: forested, scrub shrub, emergent, wet meadow, peatland, and open water. In addition, great ponds and certain freshwater wetlands are considered Wetlands of Special Significance, as defined by the MDEP rules.

Wetland scientists conducted wetland delineations and resource surveys in 2015, 2016, and 2017, as well as verifications of previous natural resource surveys that CMP conducted. The delineations were performed in accordance with the USACE wetland delineation methodology outlined in the USACE 1987 Wetland Delineation Manual and the Interim Regional Supplement for the Northcentral and Northeast Region. Data from field surveys were used to identify the location, acreage, and type of wetlands that may be impacted by the project. Natural resource verifications were performed in accordance with protocols developed in consultation with the MDEP and USACE.

In general, four basic wetland types were delineated for the Project.

(i) Palustrine Forested Wetlands

Palustrine forested (PFO) broad-leaved deciduous wetlands typically occur in areas where the topography is low and flat or along water bodies. Forested wetland cover types are dominated by trees and shrubs that are at least six meters tall and have developed a tolerance to a seasonal high water table (Cowardin *et al.*, 1979). Forested wetlands typically have a mature tree canopy that can have a broad range of understory and groundcover community components, depending on the species and density. These forested wetlands are typically dominated by northern white-cedar (Thuja occidentalis), balsam fir (Abies balsamia), red maple (Acer rubrum), eastern hemlock (Thuja canadensis), and red spruce (Picea rubens). Common subordinate species are gray birch (Betula populifolia), yellow birch (Betula alleghaniensis), green ash (Fraxinus pennsylvanica), and saplings of the canopy species. Shrubs such as winterberry (Ilex verticellata) and speckled alder (Alnus incana) are also present where the canopy is open. Royal fern (Osmunda regalis), cinnamon fern (Osmunda cinnamomea), sensitive fern (Onoclea sensibilis), and sphagnum moss (Sphagnum spp.) are common in the herbaceous stratum.

(ii) Palustrine Scrub-Shrub Wetlands

The palustrine scrub-shrub (PSS) wetland cover type includes areas that are dominated by saplings and shrubs that typically form a low and compact structure less than 20 feet tall (Cowardin *et al.,* 1979). The structure and composition of the vegetation within this cover type may be influenced by the water regime and by utility maintenance practices in wetlands located within existing transmission corridors. Most of these communities are seasonally flooded and often saturated to the surface. Many of the scrub-shrub wetlands along project corridors are often associated with emergent wetlands as part of large complexes. These scrub-shrub wetlands are also the dominant wetland type along existing transmission corridors.

Common vegetation in scrub-shrub wetlands throughout the transmission corridor includes speckled alder and winterberry. Other shrubs and saplings that may be present include arrowwood (Viburnum spp.), silky dogwood (Cornus amomum), wild-raisin (Viburnum cassinoides), and willow species (Salix spp.). Gray birch, yellow birch, red maple, and balsam fir saplings are also present. Shade tolerant species such as sensitive fern and cinnamon fern are often present in the herb stratum.

(iii) Palustrine Emergent Wetlands

The palustrine emergent wetland (PEM) is characterized by erect, rooted, herbaceous hydrophytes, excluding mosses and lichens (Cowardin *et al.*, 1979). The freshwater emergent wetlands along the route include areas commonly referred to as marshes, wet meadows, and beaver flowage communities. The PEM wetland type exists independently as well as in conjunction with other wetland types, creating a more heterogeneous wetland system.

Many of the PEM wetlands are formerly forested wetlands that were cleared of tall woody vegetation and are maintained as transmission line corridor. The major distinction between the PEM wetlands on the site is hydrology. The wet, seasonally flooded or saturated wetlands include sphagnum and cat-tail swamps, extended floodplains and ephemeral ponds. The less wet, seasonally saturated wetlands are generally made up of wet meadows and sedge swamps. Common graminoid species include wool-grass (Scirpus cyperinus), soft rush (Juncus effusus), Canada bluejoint (Calamagrostis canadensis), rattlesnake mannagrass (Glyceria striata), various sedges (Carex spp.), and reed canarygrass (Phalaris arundinacea). Common herbs include broad-leaved cat-tail (Typha latifolia), sensitive fern, cinnamon fern, buttercup species (Ranunculus spp.), and swamp dewberry (Rubus hispidus). Scattered shrubs and saplings observed in some of the PEM wetlands include steeple-bush (Spiraea tomentosa), meadowsweet (Spiraea latifolia), winterberry, speckled alder, willow species, balsam fir, gray birch, and yellow birch.

(iv) Forested/Scrub-Shrub/Emergent Wetlands

Some wetlands are best characterized as having co-dominance between vegetation types, such as a mixed forested and scrub-shrub community. On National Wetland Inventory (NWI) maps, these wetlands can appear as PFO/PSS, PFO/PEM, or PSS/PEM and may occur as adjacent communities within a single wetland or as a single co-dominant community. Adjacent wetland community types are often found in the same wetland that occur both in a natural state as well as within maintained utility corridors. Communities with mixed dominance are composed of vegetation similar to that described above for separate forested, emergent, and scrub-shrub wetlands.

The following provides an overview of wetlands identified in each project component. Note that the identified wetland numbers and acreages only document resources within the proposed transmission line corridor, and do not represent impacts to those resources.

3.2.1.1. Section 3006 +/- 320 kV HVDC transmission line

CMP completed field delineations and verification surveys of wetlands, water bodies and vernal pools within the Section 3006 transmission line corridor in 2015, 2016, and 2017. One thousand one hundred and seven (1,107) wetlands, covering approximately 1,051.2 acres, were identified within the HVDC corridor. These wetlands are generally classified as PEM, PFO, PSS, or a combination of these classifications.

3.2.1.2. Merrill Road Converter Station and associated Section 3007 345 kV transmission line

CMP completed field delineations of wetlands, water bodies and vernal pools in 2017 on the Merrill Road Converter Station parcel and the associated approximately 1.2 mile 345 kV transmission line corridor that will connect the Merrill Road Converter Station with the Larrabee Road Substation. Three wetland areas totaling less than two acres are located on the 20 acre converter station parcel and four wetland areas are located on the associated Section 3007 transmission corridor, with a total wetland acreage of approximately 33.50 acres. Identified wetlands were generally classified as PEM, PFO, and PSS.

3.2.1.3. Larrabee Road Substation Upgrade

The proposed connection to the Merrill Road Converter Station via the Section 3007 transmission line, as well as associated upgrades at Larrabee Road Substation, are within the existing fenced substation yard and will not impact wetlands.

3.2.2. Temporary and Permanent Wetland Impact

The NECEC structure/pole locations, temporary work areas, and temporary access roads will be designed, sited and constructed to avoid (where possible) or to minimize wetland impacts to the greatest extent practicable. In most cases, existing roads or trails will be used as access points to the project corridors. Temporary impacts will occur in wetlands along access roads and in work areas, but equipment travel in wetlands will use construction matting, unless occurring during frozen ground conditions, to minimize disturbance and soil compaction and encourage rapid revegetation upon their removal.

Unavoidable permanent wetland impacts along the transmission line corridors will be limited to the installation of transmission line structures, guy anchors, and backfill or concrete associated with foundations where installation locations outside of wetlands are not feasible; and permanent conversion of forested wetland habitat to early successional (shrub/meadow) cover types.

Three wetlands, located on the Merrill Road Converter Station parcel, may be permanently impacted by the placement of fill. CMP will minimize wetland impacts to the maximum extent practicable when designing and siting the converter station yard.

All construction activities will comply with water quality standards and the Section 401 Water Quality Certification to be issued by the MDEP. All ground disturbing activities will comply with the Maine Stormwater Management Law and Erosion and Sedimentation Control Law to prevent or minimize the potential for sedimentation offsite or into wetlands and water bodies.

Installations and upgrades associated with the existing Larrabee Road Substation will be conducted within its existing developed area, *i.e.*, within the existing fenced yard. As such, no impacts to wetlands will occur at this location.

3.3. FLOODPLAINS AND WATER RESOURCES

Long-term access to water resources will not be required for the NECEC. CMP will minimize and mitigate water quality impacts through the use of proper design and planning, erosion and sedimentation control measures, and the use of equipment mats in sensitive resource areas to protect these resources. Additionally, CMP will implement environmental controls (*e.g.*, setbacks) to mitigate the potential for water quality impacts that could result from equipment maintenance and refueling, and from herbicide application during periodic vegetation management. As such, the NECEC will not unreasonably interfere with the natural flow of any surface or subsurface waters, violate any water quality law including those governing the classifications of the State's waters and will not unreasonably cause or increase the flooding of the alteration area or adjacent properties. The following describes water resources located within the project area.

3.3.1. Watersheds

Watersheds, also known as drainage basins, are areas on the landscape where all surface and groundwater collect to common outflows such as rivers, reservoirs, and mouths of bays. Different watersheds are separated by landscape high points or ridgelines. The NECEC is located within four different watersheds as defined by the U.S. Geologic Survey (USGS) at the 8 digit hydrologic unit code or sub-basin level. This includes the Upper Kennebec, Dead, Lower Kennebec, and Lower Androscoggin watersheds.

3.3.2. Surface Waters

Surface water resources in the project area were identified using USGS topographic maps, aerial imagery, and federal and state GIS-based resource data. The resources were verified during field surveys conducted in 2015, 2016 and 2017. A total of 712 surface waters have been identified as a result of these surveys. Notably, the project corridor crosses several surface water bodies, including those associated with: Moxie Pond, Kennebec River, Carrabassett River, Temple Stream, Hardy Brook, Clay Brook, Hunton Brook, Scott Brook, and the Dead River (Androscoggin).[9]

3.3.3. Floodplains

Flood zone determinations were derived from Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) data. The NECEC intersects several 100-year flood plains; permanent impacts to these zones may include structure (pole) installations and substation yards. The new Merrill Road Converter Station and the existing Larrabee Road Substation are located in areas of minimal flood hazard.

As stated earlier, the NECEC crosses several flood plains. FEMA and Maine flood hazard maps were obtained where available; however, certain portions of the project are located in unmapped areas. Based on available data, flood plains intersected by the Project are listed in Table 3-1 below.

Table 3-1 Mapped Floodplains

FIRM Flood Area ID	Flood Zone	Town	Waterbody Name
23001C_1006	A	Leeds	n/a
23001C_1031	A	Livermore Falls	Scott Brook
23001C_1033	A	Livermore Falls	Trib. to Androscoggin River
23001C_1038	AE	Livermore Falls	Hunton Brook
23001C_1039	AE	Livermore Falls	Unnamed
23001C_1040	AE	Livermore Falls	Trib. to Androscoggin River
23001C_1041	A	Livermore Falls	Trib. to Androscoggin River
23001C_1042	AE	Livermore Falls	Trib. to Androscoggin River
23001C_1357	AE	Leeds	Allen Stream
23001C_1360	AE	Leeds	Trib. to Allen Stream
23001C_1529	AE	Livermore Falls	Clay Brook/Redwater Brook
23001C_732	AE	Leeds	Trib. to Allen Stream
23001C_735	AE	Leeds	Trib. to Allen Stream
23001C_753	A	Livermore Falls	Trib. to Androscoggin River
23001C_790	AE	Livermore Falls	Clay Brook/Redwater Brook
23001C_791	AE	Livermore Falls	Clay Brook/Redwater Brook Floodway

[9] There are two Dead Rivers, the one crossed by the Project is not a recreation destination.

FIRM Flood Area ID	Flood Zone	Town	Waterbody Name
23001C_792	AE	Livermore Falls	Clay Brook/ Redwater Brook
23001C_793	A	Livermore Falls	Clay Brook/ Redwater Brook
23001C_796	AE	Leeds	Dead River
23001C_796	AE	Leeds	Trib. to Allen Stream

CMP will site project components to minimize the impacts to flood plains to the greatest extent practicable. Where unavoidable impact to floodplain areas may include clearing of vegetation, permanent fill associated with structure installation, and temporary fill associated with project access roads. Additionally, because of the limited impervious surface associated with each of the transmission line structures, construction will not cause or increase flooding or cause an unreasonable flood hazard to any neighboring structures.

3.3.4. Groundwater

Groundwater typically collects in aquifers, which are underground layers of water-bearing permeable rock, rock fractures, and unconsolidated materials (*e.g.*, sand, gravel, silt). Most of the surficial materials covering the project area consist of glacial till formed in ground moraine during the most recent glaciation period. Glacial till is typically unsuitable as major aquifer resources, but can be suitable for localized domestic supplies if sufficient coarse material is present. Significant sand and gravel aquifers are defined as bodies of coarse grained glacial material with the potential to yield 10 or more gallons-per-minute (GPM) to a properly constructed well (MEGIS 2017). The NECEP transmission line traverses 11 significant sand and gravel aquifers. The existing Larrabee Road Substation is located over one significant sand and gravel aquifer.

3.3.5. Public Water Supply

Based on a review of available information, the NECEC does not directly impact any surface water identified as a public water supply. The HVDC transmission line corridor, however, crosses the watershed of Parker Pond which serves as an alternate public drinking water supply for the towns of Jay and Livermore Falls.

3.3.6. Construction, Planning, and Mitigation

Construction related activities associated with the NECEC that have the potential to impact water resources include: clearing and grading activities, chemical and/or petroleum handling, and dewatering. Soil erosion can occur if areas disturbed during project construction are not stabilized and revegetated properly following soil disturbance. This can result in soil erosion, stream bank sloughing, and potentially the deposition of sediment in water resources. Potential spills or leaks of liquids resulting from refueling construction vehicles or storing fuel, oil, and other fluids during construction could potentially impact water resources. Dewatering activities can contribute to erosion and sedimentation or can alter the physical or chemical composition of water resources, impacting riparian and aquatic plant and animal species. Proper construction techniques and timing will ensure that any such impacts are either avoided entirely, or are temporary and minor.

As planning and engineering continues, CMP will work diligently to design and site project facilities to avoid and minimize impacts to water resources to the greatest extent practicable. To reduce potential impacts to water resources during construction, CMP will minimize the extent and duration of soil disturbance; protect exposed soils by diverting runoff to stabilized areas; install temporary and permanent erosion control measures where they are needed; and establish a rigorous and effective environmental inspection and maintenance program. (See Exhibit G). During restoration, all temporarily impacted areas will be re-graded to original contours and permanently stabilized.

CMP will require setbacks from protected natural resources and private and public water supplies for re-fueling activities. Additionally, CMP requires spill kits on all construction equipment and vehicles servicing the Project. Project construction personnel are required and instructed to report all petroleum or chemical spills, regardless of volume, to the MDEP within two hours of occurrence or first visual observation. CMP tracks spill occurrence and reporting from initial discovery through proper disposal of spill impacted materials. The U.S. Environmental Protection Agency (USEPA)/United States Coast Guard National Response Center also would be notified within 24 hours of a spill resulting in oil sheens or larger oil releases to surface waters and spills of other hazardous materials in reportable quantities. Environmental training, conducted by CMP, provides worker education on the prevention, reporting, and proper cleanup protocols for spills. Environmental inspectors provide regular oversight of and will ensure compliance with all environmental and permit requirements throughout construction.

CMP implemented these protective practices throughout construction of its recent MPRP project, in accordance with the applicable environmental permit requirements and CMP best practices, without any significant environmental incidents. CMP is confident that it will achieve similar environmental excellence and compliance on the NECEC.

3.4. CRITICAL WILDLIFE HABITAT

Critical habitat is defined by the Endangered Species Act (ESA) of 1973 (16 U.S.C. §§ 1531, *et seq.*) as a specific geographic area that contains features essential to the conservation of an endangered or threatened species and may require special management and protection. Critical habitat may include areas that are not currently occupied by the species, but the protection of which is essential to species recovery. A review of the Official Species List provided by the USFWS ECOS-IPAC web site, identified two federally protected critical habitats within the NECEC area. No state listed critical habitats are located within the project area. As described below, the NECEC will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic habitat, wildlife travel corridors, freshwater, estuarine, or marine fisheries or other aquatic life.

3.4.1. Atlantic Salmon - Gulf of Maine Distinct Population Segment

The Atlantic salmon (*Salmo salar*) is an anadromous fish in Maine that was once native to most major rivers north of the Hudson River. Remnant populations are now known to occupy a limited number of rivers across the State of Maine. Atlantic salmon typically spend two to three years in freshwater and then migrate to the ocean, where they spend an additional two to three years before returning to their natal river to spawn. While at sea the salmon grow very quickly. Those that return to spawn after one year at sea are called grilse, whereas those that return after two or more years are called salmon. After spawning in the fall, the spent adults (known as kelts or black salmon) may overwinter in the river, or may return immediately to sea. (Baum, 1997)

All waters currently or historically accessible to Atlantic salmon in New England have been designated as Essential Fish Habitat for Atlantic salmon. The Atlantic salmon (as the Gulf of Maine Distinct Population Segment [DPS] of Atlantic salmon) is federally-listed as endangered pursuant to the ESA (74 FR 29300, Jun. 19, 2009). The Gulf of Maine DPS of Atlantic salmon is jointly listed by the USFWS and the National Marine Fisheries Service (NMFS), but the USFWS has lead agency status for ESA Section 7 consultations for those programs that occur within the freshwater habitat of Atlantic salmon.

The Gulf of Maine DPS encompasses all naturally reproducing remnant populations of Atlantic salmon in a geographic range that includes all perennial rivers, streams, estuaries, and lakes connected to the marine environment, except those areas specifically excluded (74 FR 29333, Jun. 19, 2009, as amended at 74 FR 39904, Aug. 10, 2009). To date, USFWS and NMFS have determined that these populations are found in the following watersheds:

- Sheepscot River watershed;
- Ducktrap River watershed;
- Cove Brook watershed;
- Narraguagus River watershed;
- Pleasant River watershed;
- Machias River watershed;
- East Machias River watershed;
- Dennys River Watershed;
- Penobscot River;
- Androscoggin River; and

- Kennebec River.

Through a review of the National Oceanic and Atmospheric Administration (NOAA) Fisheries Atlantic Salmon Critical Habitat GIS Data Layer and the Maine Office of GIS Data Layer- Atlantic Salmon Habitat (ASHAB3) (published Apr. 15, 2016), multiple water bodies intersected by the transmission line corridors along the NECEC are considered potential habitat for Atlantic salmon. The NECEC corridor intersects the following Atlantic salmon watersheds: Upper and Lower Kennebec and Lower Androscoggin rivers. Smaller rivers identified as being potential habitat of the Atlantic salmon include the Sandy River, a drainage to the Lower Kennebec. In addition, it is likely that many perennial tributaries to these rivers contain suitable Atlantic salmon habitat. Consultation with USFWS and the MDIFW has been initiated to confirm all potential critical habitat areas; however, as a best management practice, no in-stream construction work is proposed within any stream, regardless of whether or not that stream might currently support Atlantic salmon.

Additionally, to protect the Atlantic salmon and all riparian and fisheries species, protective measures will be implemented within riparian buffers.

Within 25 feet of top of bank of all streams and rivers crossed, clearing will be limited to capable species (*i.e.*, woody species and individual specimens that are capable of growing into the conductor safety zone), and removal will be done by hand. Herbicide application will not be permitted within this 25 foot buffer when surface water is present in the stream, and no accumulation of slash will be allowed within this 25 foot buffer.

Within 100 feet of top of bank of all streams and rivers crossed, no equipment refueling or maintenance will occur, and no herbicides will be stored, mixed or transferred, unless these activities take place on a public road.

Equipment access through wetlands and over streams will be avoided as much as practicable by utilizing existing public or private access roads. If a crossing is deemed necessary, bridges (matting) are the preferred construction method as it results in the least disturbance to the waterway without significantly affecting the stream or its banks and without interfering with fish migration. All construction methods will adhere to CMP's environmental guidelines and all protection measures are consistent with CMP's Vegetation Maintenance program (see Exhibit H).

3.4.2. Canada Lynx- Contiguous United States Distinct Population Segment

In 2009, the USFWS designated 6.4 million acres of critical habitat for the Canada lynx (Lynx Canadensis) (Contiguous United States Distinct Population Segment [DPS] of Canada lynx) pursuant to the ESA. This species is also individually listed as Federally Threatened and a State Species of Special Concern. Lynx are similar in size and appearance to bobcats, averaging about 26 to 30 pounds for males and 17 to 20 pounds for females. Breeding populations are strongly correlated to the abundance of snowshoe hare, their primary food source. Lynx are common throughout the boreal forests of Alaska and Canada and the southern portion of their range once extended into the United States Rocky

Mountains, Great Lakes states, and the Northeast. Today, resident breeding populations of lynx are found in Montana, Washington, Maine, and Minnesota and lynx also have been reintroduced in Colorado.

In Maine, the Canada lynx DPS covers northwestern portions of the state and includes Aroostook and Piscataquis counties and northern Penobscot, Somerset, Franklin and Oxford counties, where snow depths are highest in the state (MDIFW, 2017). Canada lynx habitat in Maine is comprised mainly of large tracts of privately owned and intensively managed forest (Vashon *et al.*, 2008). The MDIFW and USFWS conducted a 12 year radio telemetry study (January 1999 through June 2010), which indicated that lynx occupied relatively small areas (18 square miles for males and 9 square miles for females), productivity and survival were relatively high, and lynx were often found in regenerating dense stands of spruce/fir saplings where hares were most common. Current estimates suggest between 750 and 1,000 adult lynx likely occupy the northern and western Maine spruce/fir flats (MDIFW, 2017).

Suitable habitat for the Canada lynx appears to be located along the undeveloped portion of the HVDC corridor. The Lynx Conservation Assessment and Strategy, developed by the U.S. Forest Service (USFS), Bureau of Land Management (BLM), and USFWS, provides guidelines to federal agencies to analyze and minimize effects of planned and ongoing projects on lynx and lynx habitat and recommends lynx conservation measures (Rudiger *et al.*, 2000). The Lynx Conservation Assessment document recommends developing limitations on the timing of activities, minimizing snow compaction, and developing a reclamation plan for roads and vegetation. Consultation with USFWS and MDIFW has been initiated to assess the presence of the Canada lynx within the project area and to develop a plan to minimize impacts during construction.

3.5. THREATENED OR ENDANGERED WILDLIFE

A review of the Official Species List provided by the USFWS ECOS-IPAC Web Site identified three federally protected or candidate wildlife species that occur within the NECEC area: Canada lynx (threatened), Northern Long-eared bat (Myotis septentrionalis) (threatened), and Atlantic salmon (endangered). Critical habitat associated with the Canada lynx and the Atlantic salmon are also federally listed under the ESA, and further discussed in Section 3.4. The following provides a summary of the species characteristics, habitat requirements and designated critical habitat. Additionally, the bald eagle (Haliaeetus leucocephalus), while no longer federally listed as endangered, is protected under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (Eagle Act). As demonstrated below, CMP believes that through continued coordination with state and federal wildlife agencies it will identify and avoid or minimize impacts to sensitive wildlife species which will result in minimal, if any, impact to them as a result of the Project.

3.5.1. Canada Lynx

The Canada lynx is individually listed as federally threatened under the ESA. The Canada lynx DPS is also federally listed as Critical Habitat under the ESA. Species specific details are discussed in Section 3.4. Consultation with USFWS and MDIFW has been initiated to assess the presence of the Canada lynx within the project area and to develop a plan to minimize impacts during construction.

3.5.2. Northern Long-eared Bat

The Northern Long-eared bat is found across much of the eastern and north central United States and all Canadian provinces from the Atlantic coast west to the southern Northwest Territory and eastern British Columbia. This species hibernates during the winter in caves and mines called hibernacula. In the spring and summer season, they are forest-dwelling and roost singly or in colonies underneath bark, in cavities, or in crevices of both live and dead trees. Breeding begins in late summer or early fall when males swarm the hibernacula. After a hibernation period, females establish "maternity roost" trees in the spring and pups are generally born between late May and late July (USFWS, 2017). In Maine, there is documented occurrence of Northern Long-eared bat hibernating in subsurface mines and caves and presumed occurrence in the northern hardwood and conifer forests consistent with areas found along the NECEC route. However, the known hibernacula in Maine are all outside of the NECEC route.

White-nose syndrome, a fungal disease, is the primary threat to this species, particularly in the northeast where the species' population has declined up to 99 percent (USFWS, 2017). As a result of this rapid decline, the Northern Long-eared bat was federally listed as threatened in 2015. The rulemaking under Section 4(d) of the ESA (4(d) rule) was finalized in January, 2016. The 4(d) rule, while it does not designate a critical habitat, prohibits "purposeful take," unless authorized by a permit, except under specific circumstances. "Take" is defined by the ESA as "to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect." "Purposeful take" is when the reason for some activity or action is to conduct some form of take. "Incidental take" is take that is incidental to, and not the purpose of an otherwise lawful activity. Inside the white-nose syndrome zone, which includes areas of the NECEC, all "take" within known hibernacula is prohibited and incidental take caused by tree removal is prohibited (without a permit) if the tree removal occurs within .25 mile of a known hibernacula at any time of year or tree removal cuts or destroys a known occupied maternity roost tree or any other trees within a 150 foot radius of the maternity roost tree during pup-season (June 1 through July 31) (81 FR 1900, Jan. 14, 2016).

The route from Beattie Township to The Forks (53.5 miles) is located within primarily undeveloped forestland predominately utilized for timber harvesting, and will be cleared of all capable tree species to a width of 150 feet. The NECEC has initiated consultation with USFWS and MDIFW to assess the potential presence of the Northern Long-eared bat within areas proposed for tree clearing. According to the MDIFW Furbearer and Small Mammal Biologist, the only known hibernacula in the State of Maine are located in Oxford and Piscataquis counties, well outside of the project area. CMP will continue to work with USFWS and MDIFW to identify the need for avoidance or mitigation measures.

3.5.3. Atlantic Salmon

The Atlantic salmon is individually listed as federally endangered under the ESA. The Gulf of Maine DPS for Atlantic salmon is also federally listed as Critical Habitat under the ESA. Species-specific details are discussed in Section 3.4.1. Consultation with USFWS and MDIFW has been initiated to confirm all potential critical habitat areas; however, as stated in Section 3.4.1, as a best management practice, no in-stream construction work is proposed within any stream, regardless of whether that stream currently supports Atlantic salmon.

3.5.4. Eagles

The bald eagle was delisted under the ESA in 2007 due to their successful recovery; more than 500 pairs currently nest in the State of Maine and eagles are a common sight. Bald eagles, along with golden eagles (Aquila chrysaetos), continue to be federally protected under the MBTA and the Eagle Act. These protections prohibit anyone from taking, possessing, or transporting a bald eagle or golden eagle, or the parts, nests, or eggs of such birds without prior authorization. This includes inactive nests as well as active nests. Take means to pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, destroy, molest, or disturb. Activities that directly or indirectly lead to take are prohibited without a permit (74 FR 46835, Sept. 11, 2009). The bald eagle is listed as a Recovered Species at the state level and the golden eagle remains listed as State Endangered by MDIFW.

The NECEC team will work with USFWS and MDIFW to identify eagle nests in or near the project area. The potential disturbance to eagle nests will be avoided by timing tree clearing and construction to coincide with times of the year when nests are not occupied. CMP will continue consultations to develop a plan to avoid, minimize, and mitigate potential impacts to eagles, including restricting construction between March 1 and August 31 within 660 feet of identified and confirmed active nest sites. Exceptions to this timing restriction may be requested from USFWS and MDIFW in site-specific locations if necessary for construction of the NECEC.

3.6. THREATENED OR ENDANGERED PLANT LIFE

Under the federal ESA, one plant species is federally listed as threatened within the NECEC area. The small whorled pogonia (Isotria medeoloides) is a member of the orchid family and is named for the whorl of five or six leaves near the top of the stem beneath the flower. The singular or paired flower is greenish-yellow and appears in May or June. The small whorled pogonia, although widely distributed, is rare.

This orchid grows in older hardwood stands of beech, birch, maple, oak, and hickory that have an open understory. Sometimes it can be found in open stands of hemlock. It prefers acidic soils with a thick layer of dead leaves, often on slopes near smalls streams (USFWS, 2017).

The primary threat to the small whorled pogonia is the loss of habitat due to development, forestry activity, or recreational activities and trampling. The NECEC has initiated consultation with the USFWS as well as the Maine Natural Areas Program within the Maine Department of Agriculture, Conservation and Forestry (MNAP) to identify any known small whorled pogonia individuals or communities or potential habitat in the project areas. The NECEC will avoid and minimize impact by carefully selecting access roads, laydown areas and structure locations to avoid small whorled pogonia.

3.7. NAVIGABLE WATERWAY CROSSINGS

The NECEC crosses one navigable waterway subject to USACE jurisdiction under Section 10 of the Rivers and Harbors Act of 1899 (RHA), in two separate locations. The Kennebec River is a federally-designated navigable waterway from Moosehead Lake to its confluence with the Atlantic Ocean. The preferred route for the HVDC transmission line will cross the Kennebec River at Moxie Gore and West Forks Plantation and south of Wyman Hydroelectric Dam in the town of Moscow and Concord Township. Consistent with RHA Section 10 as well as 33 C.F.R. Part 322, these navigable waterway crossings will be designed to comply with minimum clearance requirements for aerial transmission line crossings.

3.8. NATIVE AMERICAN LAND

The NECEC crosses Native American land in one location associated with the HVDC transmission line component of the Project. The NECEC proposes to cross a 300 foot wide by 300 foot long parcel owned in trust by the U.S. Government for the Passamaquoddy Tribe in Lowelltown Township (T1 R8 WBKP). CMP has entered into a letter of intent with the Passamaquoddy Tribe to enter into a long-term lease for such parcel and is currently negotiating the terms of this lease with the Tribe. CMP expects to enter into the lease by the third quarter of 2017. This lease will be subject to approval by the BIA.

3.9. FEDERAL LAND

The NECEC crosses one major federal natural resource area, the Appalachian Trail. Specifically, the preferred route for the HVDC transmission line crosses the AT near the southern terminus of Moxie Pond southeast of Baker Stream in Bald Mountain Township (T2 R3 BKB EKR). The policies of the United States National Park Service (USNPS) specify that any new crossing of the AT should be at existing disturbed locations. Consistent with this policy, the preferred route crossing of the AT co-locates the HVDC transmission line in an existing, partially cleared (*i.e.*, maintained) 300 foot-wide transmission line corridor. The portion of the AT subject to the proposed crossing is owned in fee by CMP, with an easement granted to the USNPS. The corridor in this location is currently maintained at a 150 foot width. To accommodate the proposed HVDC transmission line, in compliance with safety clearances established in the National Electric Safety Code (NESC), the portion of the corridor at the AT crossing will be cleared of all capable tree species for an additional 75 feet in width.

CMP will consult with the USNPS, the Appalachian Trail Conservancy, the Appalachian Mountain Club and other stakeholder groups with regard to the proposed AT crossing so that their concerns and policies can be considered during project design, construction, and operation.

3.10. GEOMORPHIC AND PHYSIOGRAPHIC ENVIRONMENT

The NECEC area has been shaped by the advance and retreat of glaciers. During the most recent ice age, a continuous glacier covered all of Maine and south to southern New England, thus the project area is covered mostly by ground moraine, which is undulating and littered with boulders. Kettle ponds and other water bodies are common. The highest elevations in the project area are in the northern third of the HVDC transmission line, which is located in the Blue Mountains.

The northern portion of the HVDC transmission line is comprised of primarily Devonian-age volcanic and plutonic mountains. The southern portion of the HVDC transmission line is comprised of rolling ground moraine overlying highly metamorphosed sedimentary rocks located in what is known as the Central Maine slate belt.

The NECEC will require surficial excavation and grading (for substation and converter sites) during construction. The transmission line and substation components will be sited and designed to best conform to existing topographic features. Once construction is complete, areas that were excavated or graded for construction will be restored to pre-construction conditions. Conductor pull pad locations may require grading if they are not already level, and some equipment laydown areas and access paths may require leveling as well. These areas will also be restored to pre-construction conditions after construction is complete.

3.11. SOILS

The formative soils of the project fall into two major orders, each with typical and distinct vegetation patterns that are formed at the surface. The two major orders of the study area are described briefly here (NRCS, 2017).

3.11.1. Spodosols

Spodosols are soils in which amorphous mixtures of organic matter and aluminum, with or without iron, have accumulated. In undisturbed soils there is normally an overlying eluvial horizon, generally gray to light gray in color, which has the color of more or less uncoated quartz. Most Spodosols have little silicate clay. The particle-size class is mostly sandy, sandy-skeletal, coarse-loamy, loamy, loamy-skeletal, or coarse-silty.

3.11.2. Inceptisols

Inceptisols are soils of humid and subhumid regions that have altered horizons that have lost bases or iron and aluminum but retain some weatherable minerals. They do not have an illuvial horizon enriched with either silicate clay or with an amorphous mixture of aluminum and organic carbon. The Inceptisols may have many kinds of diagnostic horizons, but argillic, natric kandic, spodic and oxic horizons are excluded.

Temporary impacts resulting from the project will be from construction activities, such as: tree cutting, site clearing, grading, excavation at structure locations, pulling and tensioning sites, setup areas, and as a result of equipment travel. Soil erosion may occur following vegetation removal if not properly stabilized or if revegetation is inadequate following restoration, especially on fine textured soils that occur on sloping topography.

Soil disturbance associated with construction activities will be minimized and mitigated by implementing best management practices, including but not limited to temporary stabilization measures. Topsoil stripping and segregation prior to construction and de-compaction following construction will be performed as necessary. To the extent practicable, the project will limit construction activity during periods of heavy rainfall or snowmelt, or excessive soil saturation. Timber equipment matting will be used to minimize rutting and soil compaction. Grading to restore natural site contours and repair rutted areas will be completed prior to final restoration.

Given these measures, it is not anticipated that project development activities will result in adverse impacts to soils.

3.12. CLIMATE

The NECEC will deliver renewably-generated electricity and will help diversify the energy supply to the New England region. This project is proposed in response to the Massachusetts RFP to provide a cost-effective and environmentally friendly transmission path to deliver the clean energy generation sought by the RFP from Québec-based sources, as described in Section 2.1. The delivery of Québec-sourced Clean Energy Generation will reduce GHG emissions from fossil-fuel fired thermal generation in New England while providing enhanced electric reliability.

Climate change, both locally and globally, describes the gradual increase or decrease in average surficial temperatures, or changes in the frequency or intensity of precipitation, wind, or other climate variables. Multiple influences, both natural and anthropogenic, contribute to climate change. As further discussed in Section 3.17 below, construction of the NECEC will result in minimal, temporary impacts on air quality from construction personnel commuter traffic, exhaust from construction vehicles, and dust generated by construction activities along unpaved roads. The Project does not include activities or components that have the potential to substantially increase GHG emissions, either temporarily or permanently. Since the goal of the project will be to reduce GHG by replacing fossil-fuel fired thermal generation with renewable clean energy generation, the Project is expected to have a positive impact on climate change, *i.e.*, the NECEC will replace electricity-generating sources that contribute to climate change, with renewably-generated electricity the generation of which does not contribute to climate change. A production cost modeling study performed by Daymark Energy Advisors concludes that the NECEC's delivery of 1,200 MW of renewable generation to the New England Control Area will reduce just Massachusetts carbon dioxide (CO2) emissions by approximately 1.0 million metric ton per year.

3.13. VEGETATION

The NECEC traverses a variety of vegetative communities. Natural community types were classified based on MNAP's Natural Landscapes of Maine - A Guide to Natural Communities and Ecosystems (Gawler and Cutko, 2010). The cover types within and adjacent to the project area can be classified into four broad categories: wooded uplands; wooded wetlands; open uplands; and open wetlands. Additionally, the existing developed corridor travels through developed areas (*i.e.*, residential, commercial, and industrial). MNAP further defines each of these natural community types by class, sub-class, and natural community type. MNAP ranks natural community types: S1 to S5. MNAP seeks to protect natural community types that are state ranked S1, S2, and S3 as well as outstanding examples of S4 and S5 communities (*e.g.*, large or old growth forest stands).

Examples of the most common and widespread natural community types found near the transmission line corridor consist of the following:

3.13.1. Wooded Uplands

Much of the lands in and adjacent to the NECEC transmission corridor consist of wooded uplands. Natural communities found in the vicinity of the Project include: Oak-Pine Forest, White Pine Forest, Spruce-Northern Hardwoods Forest, Montane Spruce- Fir Forest, Lower Elevation Spruce-Fir forest, Oak-Northern Hardwoods Forest, Early Successional Forest.

3.13.2. Wooded Wetlands

Most of the forested wetlands near the project area are classified as broad-leaved deciduous and/or needle-leaved evergreen forested wetlands. Natural communities found in the vicinity of the project may include: Red Maple Swamp, Black Ash Swamp, Black Spruce Bog, Evergreen Seepage Forest, Northern White Cedar Swamp, and Open Cedar Fen.

3.13.3. Open Uplands

Open uplands are commonly found in the western Maine mountains in alpine areas. This broad category is not as commonly present; however, it may include Heath Alpine Ridge, Acidic Cliffs, Low Elevation Bald, and Spruce-Fir Krummholz.

3.13.4. Open Wetlands

Many palustrine wetlands exist within the project area. Predominately, these include the forested, scrub-shrub, and emergent wetland cover types. Natural communities found in the vicinity of the Project may include: Open Water Marsh, Dwarf Shrub Bog, Grassy Shrub Marsh, Cattail Marsh, and Alder Thicket.

3.13.5. Developed Areas

Much of the land located in the project area is undeveloped; however, some developed areas do exist, particularly along the southern portion of the project. These areas generally have altered vegetative communities due to human occupancy and are defined as residential, commercial, and industrial.

Approximately 64% of the NECEC will be co-located within already developed transmission line corridor. CMP conducts transmission line vegetation maintenance on a four year cycle. All hardwoods over eight-feet tall and most softwood species are removed from the corridor. Additionally, herbicides, approved for use by the USEPA and registered with the Maine Board of Pesticides Control, are applied to capable species. The managed corridors are dominated by shrubs and herbaceous species as well as wetland vegetation. Temporary impacts to all vegetation types will occur during construction due to tree clearing activities and access road construction, and at structure locations. Existing, open shrub/herbaceous land cover will remain intact following construction except at the new structure locations. Transmission line corridors will be allowed to revegetate to early successional habitat and will be maintained as early successional habitat under CMP's vegetation maintenance program.

Approximately 36% of the NECEC route consists of previously undeveloped land. Largely, the route from Beattie Township to The Forks is undeveloped wooded upland primarily utilized by the logging industry for timber production and regularly harvested. This approximately 53.5 miles of transmission corridor will be cleared to a width of 150 feet. CMP will perform additional clearing to widen the existing transmission line corridor to accommodate new line construction and the new Merrill Road Converter Station. Temporary impacts on natural communities will occur during tree clearing activities, construction of access roads and at the Merrill Road Converter Station. The project areas will be allowed to revegetate with native grasses, shrubs and herbaceous species and will be managed per CMP's Post Construction Vegetation Maintenance Plan, a copy of which is attached as Exhibit H.

Approximately 1,812 acres of wooded upland and 235.3 acres of wetland will be permanently converted to early successional (scrub-shrub) habitat.

CMP will coordinate with the MNAP to identify exemplary and state ranked natural communities located within or near the project areas. CMP will also work with MNAP to ensure that potential impacts have been considered and either avoided entirely or, if unavoidable, minimized or mitigated.

3.14. LAND USE

Land uses in the vicinity of the NECEC generally include forestry, agriculture, residential/commercial/industrial, transportation, recreation, conservation, historical, and natural features such as rivers, lakes, wetlands, and wildlife habitat areas. These uses will continue uninterrupted during the construction, operation, and maintenance of the transmission lines and the associated facilities.

Based on local assessors' databases (MEGIS, 2017), Maine Land Use Planning Commission (LUPC) protection and development zones (MEGIS, Sept. 1, 2015), and the National Land Cover Database 2011 (MRLC, 2011), approximately 81% of the land within the Project corridor consists of forestland or open land. (Open land may be categorized as barren land, herbaceous grassland, or scrub-shrub.)

Table 3-2 Land Use Summary

Land Use	Acres	Percent Area
Forest	3109.45	47%
Open Land	2213.47	34%
Agricultural	489.79	7%
Wetlands/Open Water	428.51	7%
Developed (Res./Comm./Ind.)	267.62	4%
Public Utilities	53.96	1%
Totals	8631.39	100%

The NECEC will consist of approximately 146.5 miles of transmission corridor. Of this, 93 miles will follow an existing transmission corridor and 53.5 miles will be within newly developed corridor. In addition to the DC transmission line, a new DC to AC converter station and 345 kV transmission line connecting the converter station to Larrabee Road Substation will be constructed in Lewiston, Maine. Existing public and private roads will be used to access the transmission corridor and associated facilities. Land use impacts are expected to be minimal as the land uses near the Project generally are compatible with the siting, construction, and operation of transmission lines. A majority (approximately 64%) of the NECEC transmission line will be constructed within existing transmission corridors.

The existing transmission line corridor between The Forks Plantation and Larrabee Road Substation, traverses or is bordered by agricultural lands, forests, commercial areas, residential neighborhoods, recreational areas, areas of scenic and historic significance, and a wide variety of wildlife habitat. In many cases, the existing corridor pre-dates nearby land uses, and by being sited within or adjacent to the existing corridor, the Project will maintain existing land use patterns along the existing corridor.

Approximately 64% of the Project is co-located within an existing CMP corridor. Using an already developed corridor minimizes impacts to existing land uses as well as the environment, and is a sound land use and environmental siting principle. The approximately 53.5 miles of new corridor between Beattie Township and an existing transmission line corridor in The Forks Plantation traverses sparsely populated land, which is primarily forested and managed for timber production and regularly harvested, and recreational uses (*e.g.*, hunting, fishing, hiking, recreational vehicle use, etc.). These uses will also continue uninterrupted during and after construction.

Anticipated temporary construction activities include construction and vehicle traffic, traffic diversion, clearing of all capable woody vegetation, grading of lay down areas for equipment, excavation, temporary matted wetland and stream crossings, and other associated construction activities. The long-term operation of the NECEC will not interfere with existing or future land use patterns.

Land use impacts are considered under Maine's Site Location of Development Act (SLODA), administered by the MDEP, local municipal ordinances, and the compliance certification requirements of the Maine LUPC.

3.15. AESTHETICS

CMP and its consultants are preparing a Visual Impact Assessment (VIA) following the requirements of the Maine Site Location of Development Act (Chapter 375.14, Scenic Character) and the Maine Natural Resources Protection Act (Chapter 315, Assessing and Mitigating Impacts to Existing Scenic and Aesthetic Uses). Chapter 315 requires demonstration that the NECEC project will not unreasonably interfere with existing scenic and aesthetic uses of scenic resources within the Area of Potential Effect (APE). The APE has been defined as three miles on either side of the transmission corridor, and areas where the corridor would be visible from elevated landforms within five miles. Elevated viewpoints on the Appalachian Trail within 10 miles of the NECEC were included within the APE. All aesthetic and scenic resources within five miles of either side of the transmission corridor have been inventoried.

Known points of visual sensitivity and scenic resources, as defined by each municipality and the MDEP in its Chapter 315 rule, have been inventoried within the APE. Other publicly accessible conservation land holdings and historic and cultural resources were also identified and assessed with respect to Section 106 National Historic Preservation Act (NHPA) standards. CMP has prepared a summary of historic resources currently included on, or potentially eligible for listing on the National Register of Historic Places in coordination with the Maine Historic Preservation Commission/State Historic Preservation Officer and is provided in Table 3-11 below.

The VIA will include a: project overview; description of data collection methodology; description of the project study area; site context and distance zones; Scenic Resources inventory (using the MDEP Visual Evaluation Field Survey Checklist); viewshed analysis and mapping; photo-simulations from Key Observation Points (KOPs); description of the affected population (motorists, residents, recreational users, and working population); visual impact assessment describing landscape compatibility (color, line, form, and texture), scale contrast, and spatial dominance; mitigation strategies; conclusion; and appendices including a photo log showing representative views of the project area.

The scenic resources inventoried and assessed include: National Natural Landmarks (Number Five Bog in T5 R7, BKP WKR and Bradstreet Township); State Wildlife Refuges, Sanctuaries, and Preserves; State or Federal Trails (Appalachian Trail, including Bald Mountain in Township T2 R3 BKP EKR and Pleasant Pond Mountain in The Forks Plantation); public sites or structures listed on, or potentially eligible for listing on, the National Register of Historic Places (Arnold Trail, historic districts, various structures); national or state parks and Maine Public Reserved Lands; municipal parks and open space; publicly-owned land visited, in part, for the use, observation, enjoyment and appreciation of natural or man-made visual qualities; and public resources, such as great ponds and navigable rivers (great ponds include: Attean Pond in Attean Township; Fish Pond in Hobbstown Township; Moxie Pond in East Moxie Township; Parlin Pond in Parlin Pond Township, Rock Pond in T5 R6 BKP WKR; Spencer Lake in Hobbstown Township; and Whipple Pond in T5 R7 BKP WKR. Remote ponds include Tobey Pond in T5 R7 BKP WKR. Major rivers crossings include state designated scenic rivers such as the Kennebec River and Moxie Stream in Moxie Gore.

The majority of the proposed DC transmission line route and 345 kV transmission line connecting the Merrill Road Converter Station to the Larrabee Road Substation (93 of 146.5 total miles) is located within or immediately adjacent to existing transmission corridors, minimizing overall visual impacts. In the northern- and western-most portion of the proposed route (approximately 52.3 miles from the Maine-Québec border to Moxie Gore) where there is no existing developed transmission corridor, other mitigation measures will be considered and adopted, if appropriate, to reduce visual impacts.

The majority of the proposed undeveloped transmission line corridor has been sited in working forestlands, avoiding higher elevation and publicly accessible conservation lands. The crossings of the Kennebec River and Moxie Stream have been located, and will be designed and constructed, to minimize the duration and magnitude of their impacts on views by recreational boaters and other users to the extent practicable.

The crossing of the Appalachian Trail is located within an existing transmission corridor in Bald Mountain Township T2 R3 BKP EKR. Two elevated viewpoints on the Appalachian Trail within the APE may have limited views of the transmission line to be located within the existing corridor. However, due to the existing transmission corridor location within a valley, and a generally parallel orientation to the viewer, the overall visibility of the transmission line will be minimal.

In addition to the above design considerations, CMP will assess the need for roadside vegetated buffers for those transmission line road crossings that are determined to result in a significant visual impact.

3.16. NOISE

The terms "noise" and "sound" are often used interchangeably, with noise usually being considered unwanted sound. A sound level can be described using two different characteristics: sound power and sound pressure. Every source that produces sound has a sound power level. The sound power level is the acoustical energy emitted by a sound source and is an absolute number that is not affected by the environment. The acoustical energy produced by a source propagates through the air as air pressure fluctuations. These pressure fluctuations, also called sound pressure, are what human ears hear and microphones measure.

Sound energy is physically characterized by amplitude and frequency. Sound amplitude is measured in decibels (dB) as the logarithmic ratio of a sound pressure to a reference sound pressure (20 microPascals). The reference sound pressure corresponds to the typical threshold of human hearing. A 3 dB change in a continuous broadband sound level is generally considered "just barely perceptible" to the average listener. A 6 dB change is generally considered "clearly noticeable," and a 10 dB change is generally considered a doubling (or halving, if the sound decreases) of the apparent loudness.

Sound waves fluctuate at specific frequencies, depending on the nature and characteristics of the source. Frequency is measured in Hertz (Hz), which is the number of cycles per second. The typical human ear can hear frequencies ranging from approximately 20 to 20,000 Hz. Normally, the human ear is most sensitive to sounds in the middle frequencies (1,000 to 8,000 Hz) and is less sensitive to sounds in low and high frequencies. As such, the A-weighting scale was developed to simulate the frequency response of the human ear to sounds at typical environmental levels. The A-weighting scale emphasizes sounds in the middle frequencies and de-emphasizes sounds in the low and high frequencies. Any sound level to which the A-weighting scale has been applied is expressed in dBA. For reference, the sound pressure level and subjective loudness associated with some common sound sources are listed in Table 3-3.

Table 3-3 Typical Sound Pressure Levels Associated with Common Sound Sources

Sound Pressure Level (dBA)	Subjective Evaluation	Environment	
		Outdoor	Indoor
140	Deafening	Jet aircraft at 75 ft	--
130	Threshold of pain	Jet aircraft during takeoff at a distance of 300 ft	--
120	Threshold of feeling	Elevated train	Hard rock band
110	--	Jet flyover at 1,000 ft	Inside propeller plane
100	Very loud	Power mower, motorcycle at 25 ft, auto horn at 10 ft, crowd noise at football game	--
90	--	Propeller plane flyover at 1,000 ft, noisy urban street	Full symphony or band, food blender, noisy factory
80	Moderately loud	Diesel truck (40 mph) at 50 ft	Inside auto at high speed, garbage disposal
70	Loud	B-757 cabin during flight	Close conversation, vacuum cleaner
60	Moderate	Air-conditioner condenser at 15 ft, near highway traffic	General office
50	Quiet	--	Private office
40	--	Farm field with light breeze, birdcalls	Soft stereo music in residence
30	Very quiet	Quiet residential neighborhood	Bedroom, average residence (without TV and stereo)
20	--	Rustling leaves	Quiet theater, whisper
10	Just audible	--	Human breathing
0	Threshold of hearing	--	--

Source:
(1) Adapted from *Architectural Acoustics*, M. David Egan, 1988
(2) *Architectural Graphic Standards*, Ramsey and Sleeper, 1994

Although an instantaneous sound level measured in dBA may indicate the level of noise experienced by an observer at that point in time, environmental sound levels vary continuously. Sound in the environment is constantly fluctuating, for example, when a car drives by, a dog barks, or a plane passes overhead. Most ambient environmental sounds include a mixture of identifiable sources and a relatively steady background sound where no particular source is identifiable. To describe the time-varying character of environmental noise, statistical noise descriptors can be used. A descriptor called the equivalent sound level (Leq) is used to describe the average sound level for a specific time period. It is the "equivalent" constant sound level that would have to be produced by a given constant source to equal the average acoustic energy contained in the fluctuating sound level measured during a time period. The exceedance sound level descriptor, Lx, is the sound level exceeded "x" percent of the sampling period and is referred to as a statistical sound level. L90 is the sound level equaled or exceeded during 90 percent of a given time interval and is often used to represent background sound levels without the influence of extraneous sounds.

3.16.1. Noise Laws, Ordinances, Regulations, and Standards

The regulation of noise falls within the jurisdiction of the MDEP and various municipalities along the NECEC. The MDEP noise rule (SLODA Chapter 375.10, Control of Noise) includes a noise standard for proposed developments in municipalities without a local, quantifiable noise standard, or with a standard that is not sufficiently rigorous, and in unorganized and deorganized areas of the State. The most conservative decibel limits under SLODA include 55 dBA during the daytime (7 AM – 7 PM) and 45 dBA during the night (7 PM – 7 AM) at the property line of any protected location, such as a residential property. The MDEP requires that a 5 dBA penalty be added to the measured total dBA when pure tones are observed. The MDEP also regulates sound during construction. Nighttime construction noise levels cannot exceed the standard nighttime noise limit, and daytime construction noise is subject to a sliding-scale limit based on the duration of the construction activities.

Some local Maine jurisdictions that the NECEC traverses have their own specific noise regulations. These localities are Lewiston, Auburn, Greene, Leeds, New Sharon, and Durham. The specific sound pressure level limits in each of the localities are summarized in Table 3-4.

Table 3-4. Municipal Sound Pressure Level Limits

Locality	Sound Pressure Level Limit (dBA) Daytime / Nighttime			Source of Limit
	Residential	Business / Commercial	Industrial	
Lewiston	50	60	70	City of Lewiston Code of Ordinances Appendix A Section 19
Greene	55 / 45[b]	65 / 55[b]	70 / 60[b]	Town of Greene Code of Ordinances Section 6-501.1
Leeds	55 / 45[b]	65 / 55[b]	70 / 60[b]	Town of Leeds Code of Ordinances Section 5.F.14
New Sharon	55 / 45[a,c]	65 / 55[a]	70 / 60[a]	Town of New Sharon Site Plan Review Ordinance Section IV

(a) Daytime is 7 a.m. to 7 p.m. and nighttime is 7 p.m. to 7 a.m.
(b) Daytime is 7 a.m. to 10 p.m. and nighttime is 10 p.m. to 7 a.m.
(c) New Sharon also has institutional limits identical to the residential limits

CMP is committed to full compliance with state laws and local noise ordinances and to ensure that the NECEC will fit harmoniously into the existing natural environment and the development will not adversely affect existing uses or other natural resources in the municipality or in neighboring municipalities, including with respect to noise.

3.16.2. Existing Noise Conditions

Land use throughout the NECEC includes rural, forested, and undeveloped areas, with some scattered residences and other areas of localized development. Existing noise along the NECEC consists of natural sounds such as animals, insects, wind, and rustling vegetation. In areas where existing infrastructure exists, there will be sounds common to substations, roadways, and other human-caused activities. There will be minimal noise associated with the existing power lines the NECEC will parallel. Because the primary land uses within most of the NECEC are forested and/or agricultural with minimal rural residential populations, the average noise levels in these areas ranged from 20 to 40 dBA during the day and night. For areas with a more prominent human presence, ambient noise levels ranged from 30 to 50 dBA during the day and night, with some measured ambient levels exceeding the MDEP regulatory limit. (See Table 3-5).

To establish existing ambient noise levels, measurements were collected by Burn & McDonnell personnel along the proposed transmission line route and near the existing Larrabee Road Substation from May 27 to 29, 2017. Long-term continuous monitors and short-term measurements were used to established ambient sound levels along the proposed route.

Burn & McDonnell personnel utilized four long-term noise meters to continuously record noise data throughout the three day study. These noise meters were unmanned for the majority of the time. All measurements were taken using an American National

Standards Institute (ANSI) S1.4 type 1 sound-level meters (Larson-Davis Model 831). The sound level meters were field calibrated before and after each set of measurements. None of the calibration level changes exceeded ± 0.5 dB, which is within the acceptable variance per ANSI guidance. A windscreen was used at all times on the microphones to avoid the influence of wind-induced sound increases.

Four continuous, long-term noise meters were used to establish ambient sound levels along the transmission line route. Meters were located in the undeveloped portion of the corridor, within the existing corridor adjacent to the Appalachian Trail crossing and further south in the existing corridor in areas with scattered nearby residences. The meters were installed at an elevation of approximately 5 feet above the ground surface.

These meters recorded overall sound, octave bands, and various other sound metrics each second of the measurement period. Measured sound levels fluctuated due to background sound sources. The one second average sound levels showed constant fluctuations in sound. The average ambient sound levels for daytime and nighttime periods for each of the continuous sound level meters are provided below in Table 3-5.

Table 3-5. Average Ambient Daytime and Nighttime Sound Levels

Monitor Location	Daytime Sound Level		Nighttime Sound Level	
	Leq (dBA)	**L90 (dBA)**	**Leq (dBA)**	**L90 (dBA)**
Meter 1	34.2	34.1	35.8	35.6
Meter 2 (location A)	37.5	37.4	28.8	28.8
Meter 2 (location B)	33.0	33.0	26.3	26.4
Meter 3	38.4	38.2	28.9	28.8
Meter 4	47.0	46.8	39.0	38.8

* Daytime is 7:00 AM to 7:00 PM, nighttime is 7:00 PM to 7:00 AM

Meter 4 was installed in the existing transmission line corridor near the undeveloped Merrill Road Converter Station site. General sound levels were taken to document ambient conditions near both the transmission line and converter station at that location.

Short-term measurements were collected near the Larrabee Road Substation. The short-term measurements were taken during daytime and nighttime hours to establish operating sound levels near the substation throughout a 24 hour period. The measurements were taken at locations along the substation fenceline and in the directions of neighboring properties. The collected data are being used as baseline sound levels to establish future operational sound levels in the noise modeling studies.

3.16.3. Potential Impacts

There are different types of sounds to consider when analyzing a typical transmission system's impacts. There are temporary sounds associated with the construction of specific facilities within a system, and there are long-term sounds associated with the operation of the system. The NECEC is no different, and will generally create sound during construction and, to a lesser extent, during operation of the transmission lines, substations, and converter station. These potential impacts are described in the next sections.

3.16.4. Construction

Construction noise will be associated with various activities and will occur for various durations. Construction of the NECEC is expected to last about 35 months and will involve tree and site clearing, excavation, placement of concrete, and typical industrial construction practices. Minimal, temporary noise impacts as a result of program-related construction activities may occur. All construction will be performed to limit impacts as much as practicable. Best management practices and specific construction methods that reduce construction noise will be implemented, where appropriate. Because the NECEC involves work on an existing power system that serves customers, there may also be times during which work must occur outside of normal working hours. In addition, there are certain operations that, due to their nature or scope, must be accomplished in part outside of normal working hours. Such work generally consists of activities that must occur continuously, once begun (such as filling a transformer with oil). Construction noise will comply with all applicable MDEP and local laws, ordinance, regulations, and standards.

The impacts that various construction-related activities might have will vary considerably based on the proximity of the various NECEC components and corridor to adjacent property lines. Generic sound data ranges are available for various types of equipment at certain distances. Table 3-6 lists generic construction activities and the associated sound levels at a distance of 50 feet.

Table 3-6 Range of Typical Construction Equipment Noise Levels (dBA)*

Generic Construction Equipment	Minimum Noise at 50 feet	Maximum Noise at 50 feet
Backhoes	74	92
Compressors	73	86
Concrete Mixers	76	88
Cranes (movable)	70	94
Dozers	65	95
Front Loaders	77	96
Generators	71	83
Graders	72	91
Jack Hammers and Rock Drills	80	98
Pumps	69	71
Scrapers	76	95
Trucks	83	96

** Values taken from FHWA Highway Construction Noise and the HEARS database*

The types of equipment listed in the table above will be used at various times and for various amounts of time. All equipment noise will be addressed during construction, and sound abatement may be used, if necessary. Most activities would not occur at the same time. For example, there will be periods during which concrete needs to cure and no construction may occur. Typical maximum sound levels during any of these activities would be between 85 and 95 dBA at 50 feet, and will be intermittent and/or will only last for a short duration. However, sound levels would quickly drop, similar to what happens when a car passes by. Sound levels will be lower in areas where activities are occurring at distances greater than 50 feet from the NECEC corridor or property lines.

3.16.5. Operation

Operational noise of a transmission system comes from the transmission lines and associated equipment, but primarily from the system's substations that contain transformers. Sound from transmission lines is generally corona discharge – the ionization of liquids on the various electrical components of the transmission system. Substations also contain various pieces of equipment that could generate corona noise. However, substations also contain transformers that generate noise in various other ways. According to Institute of Electrical and Electronic Engineers (IEEE) Standard C57.12.90 and C57.136, the principal sources of sound in transformers are the core sound, load current sound, and sound from cooling equipment. The core sound is caused by magnetostriction effects and inter-laminar magnetic forces. It is influenced by the flux density, core material, core geometry, and excitation voltage waveform. The load sound is caused by electromagnetic forces resulting from leakage fields. It is proportional to the load current and is predominately produced by the axial and radial vibrations of the windings. The sound from cooling equipment is generally caused by the cooling fans. The fan noise is influenced by the blade-tip speed, blade design, and the number of fans. Pump noise is typically insignificant when fans are running.

Operational noise from the Merrill Road Converter Station and the Fickett Road Substation (which is beyond the scope of the Project for purposes of this Application) will be generated by the equipment at each location. Each site will be designed and sited to achieve the MDEP and local limit criteria for protected locations. Preliminary modeling shows that the criteria are achievable through specific design and mitigation efforts. As the NECEC progresses, the design will be updated, and mitigation will be applied as necessary to continue to meet the applicable criteria.

3.17. AIR QUALITY

No degradation of air quality will result from construction and operation of the proposed NECEC. Minor, temporary impacts on air quality as a result of program-related construction activities may occur. Such impacts may result from construction personnel commuter traffic, exhaust from construction vehicles, and dust generated by construction activities along unpaved roads. Given the limited duration of activities at any one location, the generally rural nature of the NECEC project area and the existing uses of unpaved roads along the transmission line corridors (*e.g.*, logging and associated trucking), any construction-related influences on overall air quality will be insignificant. Emissions of fugitive dust will depend on such factors as soil properties (*e.g.,* moisture content, volume of spoils, and soil fines content), meteorological variables, and construction practices employed. Fugitive dust is only expected at substation construction sites and along unpaved construction access roads. Best management construction practices will be employed to minimize emissions of fugitive dust, including:

- Use of water or other wetting agents on areas of exposed and dry soils before or during windy conditions;
- Use of covered trucks for transport of soils or other dry materials;
- Controlled storage of spoils on the construction site which may include mulching storage piles with hay or covering with tarps in concert with containing the piles with erosion control mix and/or silt fencing; and,
- Final grading, landscaping, and revegetation or permanent stabilization with approved materials as soon as practical.

Other than back-up generation that would operate only during the loss of primary power, there will be no non-mobile air emissions associated with the NECEC. CMP may deploy one or more temporary, portable (trailer - mounted) 2 MW distributed generation (DG) units during and immediately following the NECEC construction. These units may be utilized during construction, maintenance/repair, reconfiguration, or cutover of new facilities to provide local voltage support. Up to four of these units may be installed, as needed, at any substation site. MDEP Air Emission License #A-952-71-B-R (SM), issued to CMP on August 12, 2013, regulates air emissions from these DG units. The license requires the use of ultra-low sulfur diesel fuel (maximum sulfur content 0.0015% = 15 ppm). CMP anticipates that the MDEP will determine that no unreasonable adverse effect on air quality will result from the NECEC.

3.18. ELECTRIC AND MAGNETIC FIELDS

CMP has not completed its Electric and Magnetic Fields (EMF) Study and will supplement this Application when the study is completed.

3.19. HISTORIC AND CULTURAL RESOURCES

The Presidential Permit application will trigger review under, and require compliance with, Section 106 of the NHPA, which is implemented through regulations published at 36 C.F.R. Part 800. These regulations require federally permitted projects to avoid impacts to historic properties, and if impacts cannot be avoided, to mitigate those impacts.

CMP conducted a comprehensive desktop review to be followed by field survey in order to identify historic properties and resources potentially affected by the undertaking. The data presented below was gathered through preliminary consultation with the MHPC and does not represent a complete identification effort. Most notably, no field activities have been conducted in connection with the NECEP to date. The data presented here are intended to be the first step in compliance with Section 106 of the NHPA (see 36 C.F.R. Part 800).

Above- and below-ground cultural resources, and areas most likely to contain such resources, will be identified through desktop review and will then be subject to field study. The MHPC will provide a determination of effect for the project and may set forth measures to avoid, protect, and/or mitigate impacts to any identified historic properties. These measures may include, without limitation: siting to minimize or avoid visual impacts to above ground historical architectural resources, siting to minimize or avoid ground disturbing impacts to archeological resources, protocols for designation and signage for No Entry Areas and buffers, onsite archaeological monitoring during construction activities, and implementation of protocols for unanticipated discovery of cultural resources during construction.

This section presents the results of the cultural resources background review and highlights all known cultural resources that are listed, eligible for listing, or not yet evaluated as to their eligibility for listing, in the National Register of Historic Places (NRHP).

3.19.1. Description of the Study Area

The study area for this application varies by resource type and potential project impacts. The study area for below-ground (archaeological) resources is limited to the area where the NECEC could have direct impacts, *i.e.,* within the construction zone. The below-ground study area is composed of the anticipated ROW corridor for the NECEC. The anticipated corridor is variable in width but generally ranges from 300 to 400 feet (91 to 122 meters). The study area for above-ground resources (architectural) covers 0.5 mile (0.8 kilometers) surrounding the proposed project route and associated facilities. This 0.5 mile buffer is intended as an initial proxy for the area where the project could have indirect impacts, *i.e.* visual. The following sections summarize cultural resources investigations, archaeological sites, and above-ground cultural resources within each study area.

These study areas cross all three of Maine's Level III ecoregions. Ecoregions are classified by the EPA and are based on "regional homogeneity" or areas that "were analyzed together to sketch out regions that were relatively homogeneous in their soils, land-use, land surface form, and potential natural vegetation and to tabulate the identifying classes of each" (Omernik 1987:120). In Maine, the state is roughly bisected east-west by two large ecoregions: the Northeastern Highlands to the west, and the Acadian Plains and Hills to the east. Extreme southeastern Maine includes the Northeastern Coastal Zone. The more detailed Level IV ecoregions are useful for providing an overview of the physiographic and geologic features which are factors in locating both below- and above-ground cultural resources. The Project crosses five Level IV ecoregions in Maine (Table 3-7).

Table 3-7 USEPA Summary of Level IV Ecoregions Within the NECEC Corridor.

Level IV Ecoregion	Physiography	Surficial and Bedrock Geology
Upper Montane/ Alpine	Rocky glaciated peaks, high mountains with steep slopes, ridges. High-gradient headwater streams with boulder, cobble, and bedrock substrates.	Quaternary surficial deposits mostly absent, some thin and discontinuous deposits of sandy loamy till separated by extensive bedrock outcrops. Jurassic granite, syenite; Devonian granite, pelite, sandstone, and other metasedimentary and volcanic rocks; Silurian quartzite, pelite, and sandstone; Cambrian schist, graywacke, melange.
Quebec/New England Boundary Mountains	Low to high glaciated mountains, moderately dissected, with gentle to steep slopes and narrow to broad U-shaped valleys. Moderate to high gradient, bedrock, boulder, and cobble bottomed streams. Numerous small to large lakes, abundant wetlands.	Quaternary sandy loamy till, sand and gravel outwash, and attenuated drift with bedrock outcrops. Cambrian and Ordovician low-grade metamorphosed pelite, sandstone, and limestone; Devonian weakly metamorphosed pelite and sandstone, Devonian granite and granodiorite, Precambrian gneiss.
Moosehead/ Churchill Lakes	Rolling plains and low hills, mostly broad valleys, numerous large lakes, and some large wetlands and peatlands. Moderate and some low gradient, bedrock, boulder, and cobble-bottomed streams.	Quaternary loamy till and some sandy loamy till. Devonian weakly metamorphosed pelite and sandstone, Devonian and Ordovician mafic to felsic volcanic rocks, Cambrian melange.

Western Maine Foothills	Foothills and open low mountains. Moderate to high gradient streams, with gravel, cobble, boulder, and bedrock substrates. Some widely scattered small to medium-sized lakes and wetlands.	Quaternary sandy till and attenuated drift in southern portion, sandy loamy till and attenuated drift in the north. Devonian and Silurian moderately to highly metamorphosed pelite and sandstone, Devonian granodiorite and quartz diorite.
Central Maine Embayment	Flat to irregular plains, with some low hills; coastal beaches, bays, and tidal flats. Low gradient streams and several large rivers with silt, sand, gravel, and bedrock substrates.	Quaternary marine silt and clay, marine sand and gravel, small areas of sandy till. Silurian to Ordovician calcareous metasandstone, quartzite, and phyllite; Carboniferous and Devonian granite; Ordovician to Precambrian gneiss, schist, quartzite, amphibolite, and granite.

Prehistorically, these regions were utilized as early as ca. 11,500 years before present (BP) during the Paleoindian period. Paleoindian sites are characterized by a distinctive fluted point form and a highly curative stone tool assemblage. The archaeological record suggests a highly mobile people, with a settlement system based on small social groups that exploited seasonally available food resources, although it is also believed that caribou was likely the most significant, seasonal resource. Three phases of the Paleoindian Period have been identified based on changes in the fluted point forms and are referred to as: Early Paleoindian (approximately 11,000 to 10,400 BP), Middle Paleoindian (approximately 10,300 to 10,100 BP), and Late Paleoindian (approximately 10,100 to 9500 BP) (Bradley, *et al.,* 2008).

The Archaic period covers an approximately 7,000 year time span and marked the end of the Pleistocene epoch and the beginning of the Holocene epoch. The Holocene is characterized by a general increase in global temperatures with mean annual temperatures higher than present day (Deevey and Flint, 1957:182). As climate moderated and improved through the Late Pleistocene groups rapidly filled the landscape, and distinct regional traditions developed that reflect a greater understanding of, and adaptation to, local and regional environments. The Archaic period is characterized by hunter-gatherer economies in varying levels of sociocultural complexity, with a focus on large mammals such as caribou, moose, and deer, as well as a greater reliance on fishing and, where available, shellfish. The period is subdivided into the Early, Middle, Late, and sometimes Terminal Archaic periods based on associated changes and adaptations to the environment and projectile point styles.

Across the Eastern Woodlands, a region that extends from the Great Lakes and Mid-Atlantic up through New England and into New Brunswick, Nova Scotia, and Newfoundland (Canada), the Woodland/Ceramic period is traditionally marked by the adoption of ceramic technology, small-scale horticultural activities, and the establishment of sedentary life, including palisaded and un-palisaded villages, as well as increased sociocultural complexity and ceremonialism. It is also within this timeframe that Algonquian languages make their appearance in New England, possibly a sign of immigration from the Upper Great Lakes area. A nuanced view of the Woodland period recognizes that not all aspects of Woodland lifeways occurred simultaneously, or, in some cases and geographic areas, even at all. In

Maine, there is little to no evidence of horticulture during the Woodland period, and the advent of permanent villages is also problematic until the very end of the period. Instead, the Woodland period is most clearly marked in Maine by changing ceramic technologies, and the appearance of exotic raw materials. This has led to the Woodland period typically being referred to as the Ceramic period in Maine archaeological literature. As with the preceding Archaic period, the Woodland period is divided into three sub-periods: Early, Middle, and Late. In general, the period saw increasing population densities and concomitant increases in site size and density, along with more intensifying exploitation of faunal resources, particularly moose, possibly in accompaniment with climatic cooling.

The earliest documented contact between Europeans and the original coastal inhabitants of Maine occurred in 1498 when John Cabot traveled the coast. A period of contact, regardless of the geographic location, is a time of cultural interaction and exchange. Trade is perhaps the most tangible form of interaction and the material remains of trade allow archaeologists to identify this interaction and attempt to document the changes brought forth as a result. In coastal Maine trade likely began at an early date. European exploration (discussed more fully below) of the Maine coast began in 1498, and by the last quarter of the sixteenth century Native Americans were participating in trade with Europe, albeit probably indirectly in the vast majority of cases.

The first effort at European settlement in the coastal Maine area occurred in the early seventeenth century while by the 1630s several trading posts were established along the Maine coast, the closest only about 37 miles (60 kilometers) from the project area. The effect of these early encounters on the Native population was profound. Epidemics brought on by European diseases to which native populations had no immunity devastated local groups. These hit as early as 1610 in the Gulf of St. Lawrence where direct contact with fur traders was early and extensive, and by 1619 disease had depopulated large areas of the coast. This was compounded by a second epidemic, this one confirmed as smallpox, beginning at the Plymouth Colony in 1633 and spreading to coastal Maine the following year.

During this time both the English and the French were engaged in the fur trade with Native Americans along the coast and both empires claimed the territory. As a result of on-going warfare between England, France, and Native Americans, forts and garrisons were constructed along Maine's coast during in the seventeenth and eighteenth centuries, including Fort St. George at the mouth of the Kennebec River (Hornsby, *et al.* 2015).

Several of the towns in the project area are connected by the Kennebec and Androscoggin rivers, waterways which have played a significant role in their development. The Androscoggin River joins the Kennebec River at Merrymeeting Bay. Much of the land along the lower Androscoggin River was contained in the Pejepscot patent, and English colonists had been settling in that area since the early seventeenth century. Settlements to the north and west commenced after the British defeated the French in the Seven Years War (1754-1763). In exchange for military service during the war, land grants in this area were given out by the Massachusetts government.

Logging has historically been an important industry for communities on the Kennebec and Androscoggin rivers. In 1820, Lincoln County had 115 sawmills, Kennebec County had 87, Cumberland County had 79, and Somerset had 43 (Hornsby *et al.* 2015). The nineteenth century saw intense logging along all of Maine's rivers, and by the end of the century, concern over the negative consequences of industrialization and diminishing natural resources had increased (Judd, 2007:9). The Kennebec River saw the second largest log drives in Maine and by the 1830s several logging companies were operating on the river. Log drives on the Kennebec River ended in the 1970s (Begin, 2012). Intense industrial pollution of the Androscoggin River inspired the Clean Water Act of 1972. Much of the pollution was caused by the paper manufacturing industry beginning in the nineteenth century. By the mid-twentieth century, the Androscoggin was one of the most polluted rivers in the country (Bennett and Nickerson, 2007).

As the logging industry in Maine waned, towns switched to recreation and tourism to supplement their economies. Tourists who visited northern Maine in the second half of the nineteenth century were drawn by the promise of fishing, hunting, canoeing, and hiking through vast tracts of largely undisturbed wilderness. Sporting camps and grand hotels were constructed near rivers and lakes, such as the Mount Kineo House on Moosehead Lake (Farrar, 1890).

Fishing and shipbuilding were historically important industries for communities on the Kennebec River. English fishermen were seasonal visitors to coastal Maine with fishing fleets prior to the establishment of permanent settlements. The New England fishing industry developed in coastal towns in the mid-seventeenth century, making fish a staple of the New England economy. Along with fishing, shipping and shipbuilding developed as integral parts of Maine's (and New England's) economy. Maine timber was used to build ships in coastal Maine shipyards; merchants then exported fish caught by Maine fishermen to other parts of the British Empire. The Kennebec and Androscoggin rivers were also important travel routes into Maine's interior, before and after the arrival of railroads.

3.19.2. Known Cultural Resources and Previous Cultural Resources Investigations in the Study Area

A review of the reports on file with the MHPC indicate that 16 cultural resources investigations have been conducted within the Below-Ground Study Area. These investigations are summarized in Table 3-8. These reports indicate that 17 percent of the Study Area has been previously surveyed for archaeological resources and does not need additional survey as part of this Project's archaeological identification efforts.

Table 3-8. Previous Surveys within the Below-Ground Study Area.

Author	Title	Year	MHPC Report #
Petersen, James B.	Preliminary Phase I Archaeological and Historic Structures Survey of the HVDC Transmission Tie to Hydro Québec	1989	2533
Clark, James	Addendum Report on Phase I Archaeological Survey of the Moxie Storage Pond Project.	1992	2708
Bourque, Bruce J.	Report on the Phase I and IA Archaeological Investigations of the Proposed AT & T Fiber Optic Cable Route, Winterport to Portland.	1994	2788
Cox, Steven L.	The Anson Project (FERC 2365) Report on 1995 Archaeological Phase I and Phase II Surveys.	1995	2887
Will, Richard T.	Cultural Resource Investigations Maritimes and Northeast Pipeline, L.L.C., Phase II Pipeline Project.	1998	2991
Corey, Richard	Leeds Stumpthumpers Snowmobile Club, Lewiston to Jay Recreational Trail.	1998	3025
Clark, Julia	Cultural Resources Investigation: Maritimes and Northeast Pipeline (Phase II)	1999	3044
Mosher, John P.	Report on Phase I Archaeological Survey of Route 156 (PIN 9180.00), Chesterville.	2002	3227
Baldwin, Geraldine	Archaeological Phase I Survey for the Columbia Falls and Moscow OHTB-E Radar Stations, Washington and Somerset Counties.	2004	3486
Clark, James	Phase I Archaeological Survey: Maritimes and Northeast Pipeline, Phase IV.	2006	3530
Clark, James	Maine Power Reliability Program; Pre-Contact Archaeology Survey Report for Segments 1,4,6,17,18 and 19.	2008	3794
Mack, Karen	Maine Power Reliability Report: Pre-Contact Archaeology Survey Report, Segments 3, 9, 10, 14, 15, 27, 29, 35, 39, 40A and Substations	2009	3825
Clark, James	MPRP Pre-Contact Archaeological Phase II Summary Report	2009	3913
Clark, James	MPRP Pre-Contact Archaeological Phase II Summary Report	2009	3919
Clark, James	Phase I Pre-Contact Archaeological Resource Survey Central Maine Power Company's Section 241 Transmission Line Project	2011	3970

3.19.3. Prehistoric Archaeological Sites in the Study Area

A review of the archaeological sites database maintained by the MHPC indicates that 13 prehistoric archaeological sites have been recorded within the Below-Ground Study Area. These sites are presented in Table 3-9 along with their cultural or temporal affiliation and NRHP eligibility status.

Table 3-9. Prehistoric Archaeological Sites within the Below-Ground Study Area.

Site Number	Type	Period	NRHP Status	MHPC Report #
051-009	Prehistoric	N/A	Not Evaluated	2533
051-010	Prehistoric	N/A	Not Evaluated	2533
036-053	Prehistoric	N/A	Not Evaluated	2533
036-052	Prehistoric	N/A	Not Eligible	2533; 3913
036-051	Prehistoric	N/A	Not Eligible	2533; 3913
036-050	Prehistoric	N/A	Not Eligible	3825
036-054	Prehistoric	N/A	Not Evaluated	2533
036-044	Prehistoric	N/A	Not Evaluated	3825; 3025
024-043	Prehistoric	Archaic	Not Eligible	2533; 3794

3.19.4. Historic Archaeological Sites in the Study Area

A review of the archaeological sites database maintained by the MHPC indicates that no historic archaeological sites have been recorded within the Study Area.

3.19.5. Above-ground Cultural Resources in the Study Area

Above-ground cultural resources can include historic era buildings, historic districts, historic markers, structures such as bridges, and historic trails and railroads. A review of the MHPC database indicates that 259 above-ground resources are located within the 0.5 mile study area. The majority of these resources are related to residential (133) or farming (61) activities. Three of the 259 resources are historic districts. These resources are described and summarized in Exhibit L along with their eligibility for the NRHP.

3.19.6. Summary of Cultural Resources Constraints in the Study Area

The following cultural resources have been identified as NRHP listed (4), NRHP eligible (103), or have not been evaluated (28) against the NRHP criteria (see Table 3-11). By identifying these resources early in the project planning process, a broad range of avoidance options will be evaluated in order to avoid or minimize impacts to significant cultural resources.

Table 3-11. Summary of Listed, Eligible, and Not Evaluated Resources by Type and Study Area.

NRHP Status	Resource Type	Study Area	Count
Listed	Architecture	Above-Ground	4
Eligible	Architecture	Above-Ground	103
Not Evaluated	Architecture	Above-Ground	23
Not Evaluated	Archaeology	Below-Ground	5
Total			*135*

3.19.7. Sites Listed or Eligible for Listing on the National Register of Historic Places

The preliminary desktop study of the proposed NECEC project and its associated below-ground (archaeology) and above-ground (architecture) study areas identified a total 107 cultural resources that are listed or eligible for inclusion on the NRHP. Exhibit M presents these resources by project section and resource type with respect to the project's potential impacts and proximity. Field surveys and additional background research will be necessary in order to determine if the proposed undertaking will impact any of these sites. In addition, once identification efforts have been completed it is anticipated that the number of NRHP eligible properties will grow significantly. While additional NRHP eligible resources are likely to be identified through field survey, it is unclear what proportion of the newly and previously identified resources would be indirectly (visually) or directly (through construction/operation) impacted by the project. Additional viewshed analysis will be necessary to determine which properties are indirectly impacted and refinement of the Project's construction footprint will be necessary to determine which properties are directly impacted. Where impacts are likely, NECEC will engage stakeholders in consultation in order to minimize or eliminate project impacts.

3.20. LAND ACQUISITION

See Section 2.2.1.1 above.

3.20.1. Transmission Line Right of Way

See Section 2.2.1.1 above.

3.20.2. Converter Station Property

See Section 2.2.2.2 above.

3.21. PRECONSTRUCTION ACTIVITIES

Preconstruction activities include securing sufficient right, title, and interest in all parcels, preparation and approval of all federal, state, and local permit applications, and securing and contracting with qualified construction contractors and environmental inspectors. As discussed in Section 2.2.1.1 CMP has secured right, title, or interest in all property required to construct the Project.

Permitting actions include: outreach to all federal, state and local permit-issuing agencies, bodies and authorities; surveys and studies of protected and sensitive natural and cultural resources within and adjacent to the NECEC area; identification of all required environmental permits and approvals based on project scope and location, natural resource impacts, and jurisdictional thresholds; preparation of permit applications; public outreach; presentation of applications to the appropriate permitting authorities; ongoing consultation with natural resource and permitting agencies and authorities; timely responses to agency requests for information; and procurement of all required approvals.

Once construction contractors and environmental inspectors are secured CMP will initiate the procedures outlined in Exhibit G including construction kick-off meetings and a "walk-through" of each project component to review all permit conditions, identify sensitive areas and optimal access routes, and review best management practice to be employed that will avoid or minimize any potential impacts.

3.22. CONSTRUCTION PROCEDURES

Construction will be performed in such a manner that natural and other sensitive resources will be protected to the greatest extent practicable, construction crews will safely construct the transmission lines and substations, and erosion will be minimized. Specific environmental protection measures are discussed in Section 3.24. Impacts during site development and construction will generally be avoided and minimized through advance planning and installation of erosion and sedimentation controls and the use of construction mats for equipment travel in wetlands, over streams, and on soil types that are highly susceptible to rutting. As a result of careful construction planning, the project will not unreasonably interfere with natural water flow, violate any water quality law, or standard, or cause or increase flooding. CMP will utilize best management practices to ensure that construction will cause no unreasonable harm to wildlife habitats, including fisheries. In addition, qualified environmental inspectors will ensure that all permit conditions and compliance requirements are being met. Other mitigation measures include construction timing restrictions in environmentally-sensitive areas and/or habitats. Site development is generally regulated under the SLODA, NRPA, CWA Section 404, the Maine Erosion and Sedimentation Control Law, and occasionally under local municipal ordinances. The MDEP will review the NECEC development proposal, including design, location and construction plans, to determine their compliance with stormwater management and erosion and sedimentation control law standards. CMP has specifically designed this project to meet these standards, and anticipates that the MDEP will determine that the proposed activity will not violate any state water quality standards or laws, including those governing the classifications of the State's waters.

Construction procedures focus on establishing and implementing transmission line and substation construction methods that will be employed when traversing uplands, water bodies, and wetlands, and during tree clearing and construction of project components, while also providing flexibility to allow application of the most appropriate construction methods based on site-specific conditions.

3.22.1. Transmission Line

Construction of the transmission line components will generally follow the conventional transmission line construction sequence listed below.

- Establish construction yards and on-site staging areas;
- Flag environmental resources and buffers;
- Complete the initial program “walk-through” with NECEC team and construction contractor;
- Plan and install erosion and sedimentation controls and access at protected resources such as water bodies, wetlands, areas of saturated soils, and areas susceptible to erosion;
- Establish construction access ways;
- Clear capable vegetation as necessary;
- Clear canopy vegetation and perform limited grading as necessary to accommodate construction equipment;
- Install erosion and sedimentation controls at individual structure locations;
- Move poles and materials to structure and laydown locations;
- Complete test digging/drilling at various pole locations;
- Excavate structure holes and install structures;
- Complete restoration and grading around the structures;
- Establish “pull-pad” locations and move tensioning and pulling equipment into place;
- Thread and install pull ropes, conductor, and fiber optic wire;

- Clip conductor and remove blocks;
- Complete the construction inspection, clean-up, and restoration,
- Energize the line; and
- Complete the final program "walk-through" and restoration.

The construction contractor will typically establish at least one principal working construction yard, office and staging area in the vicinity of the corridor. This area is used to stage the bulk of construction materials such as poles, wire, and equipment and as a central point of communication. A secondary yard may be established to store some materials closer to their area of installation or use, and may serve as a landing site for helicopters. Site specific staging areas are established at strategic locations along the corridor, often where the line crosses county roads. These staging areas will be established away from protected natural resources.

Prior to tree clearing or construction activities, the NECEC team will walk the length of the transmission line with the contractor to identify critical areas where construction and construction access may be difficult due to terrain, wetland and water course conditions, or the location of protected or sensitive natural resources. Erosion control placement, access road layout, wetland and stream crossing locations will be addressed, with avoidance and minimization of wetland and waterbody impacts as a priority. The type and location of erosion controls as well as the approach to wetland and stream crossings will be confirmed at this time. Suitable access areas will be flagged with a specified color of surveyor tape, and "no-access" areas (such as certain stream buffers) will also be marked using appropriate color-coded tape.

Construction will commence once the walk-through has been completed. Installation of erosion controls and construction of access roads will be the first tasks completed. Erosion controls will be installed in accordance with the CMP Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects (August 2016), further discussed in Section 3.24, herein referred to as CMP's Environmental Guidelines, a copy of which is attached as Exhibit G.

Access roads will be established within the transmission corridor to provide construction equipment access to the structure locations. Access will be established to areas undergoing immediate construction and will be an ongoing process as construction progresses. Access roads no longer needed for construction will be restored as soon as possible. Access over wetlands will utilize construction mats, either timber or composite, during normal conditions. During winter conditions when the ground is sufficiently frozen to support equipment, mats may not be required. Where streams must be crossed, temporary bridges will be spanned to cross streams regardless of site conditions. Appropriate erosion controls will be installed wherever necessary. Streams that are too wide to cross with construction mats or temporary bridges will be avoided.

The undeveloped portion of the project along the HVDC corridor will require clearing of forested areas. Clearing will be completed in accordance with MDEP's Erosion and Sediment Control Law (38 M.R.S. § 420-C), MFS Slash Law (12 M.R.S. § 9333) and MFS best management practices. Limited clearing will also be required along the co-located (developed) portions of the transmission line corridor to accommodate the new lines. Unless required for road construction or site preparation, no grubbing will occur in order to minimize ground disturbance. Clearing of capable species within protected natural resources and stream buffers will be conducted by hand.

After access has been established, clearing completed, and erosion controls have been installed at pole sites, poles and associated equipment will either be hauled in by truck or skidder or flown in via helicopter in more remote areas. To determine if blasting will be required, pole locations may be pre-dug or drilled prior to a pole setting crew mobilizing to the area. If bedrock is encountered, blasting may be necessary. Safeguards will be employed to protect personnel and property in the vicinity of the blasting.

Holes for structures are dug to proper depth with an excavator and a crane is used to place the pole in proper alignment. The hole is backfilled with spoil and is mounded at the base of the pole and compacted. The transmission line has been designed to site poles outside of wetlands and other protected resources to the maximum extent possible, but engineering limitations may necessitate installation of some poles in these areas. In such circumstances, erosion controls will be used, grubbing will be kept to a minimum, and the disturbed areas will be restored to the original contour in order to maintain the original drainage and vegetation patterns. Once poles are installed, construction crews will restore any disturbed areas and apply temporary erosion controls.

Disturbed areas in uplands are typically seeded and/or mulched with hay (or straw, if necessary). Wetlands are not seeded; rather, when conditions allow, the replacement of topsoil (with seedbank and rootstock) to the original grade provides permanent stabilization and will be done immediately after structure installation. Disturbed areas in wetlands are then mulched with weed-free straw. This practice allows for the regeneration of natural vegetation.

Pull-pads serve as level staging areas for installing pull ropes and conductor. Conductor puller and tensioners require a large, level area for their set up and may vary in size and location. These sites must be level to support the weight of the equipment; as such, some grading may be needed. After the pull ropes are run through the blocks, the conductor will follow. Clipping of the conductor involves removing the wire from the blocks and permanently clipping it in place at the bottom of the insulators. Access required by clipping and block removal will generally be completed by use of a bucket truck. Final checks of the newly installed line will be completed prior to energization.

The construction access roads and pull-pads within wetlands will be restored to pre-construction conditions. Contours and drainages will be restored. Disturbed wetland soils may be mulched with weed-free straw for final restoration in accordance with the CMP Environmental Guidelines. Upland areas not adjacent to wetlands and streams will be seeded with an approved native seed mix and mulched with hay for stabilization. Excess construction debris (litter, hardware, bracing) will be removed from the corridor and disposed of at a licensed recycling or solid waste disposal facility. No materials will be burned or buried on the corridor. Erosion and sedimentation controls will be installed as needed and maintained through the duration of construction and restoration efforts.

The NECEC construction team will walk through the completed transmission line corridors and check for any potential erosion problems or areas that require further restoration to pre-existing conditions. Any deficiencies will be addressed as necessary until permanent stabilization and revegetation has been established, at which time the erosion and sedimentation controls will be removed.

3.22.2. Substation and Converter Station

Construction of the Merrill Road Converter Station and at the existing Larrabee Road Substation and installation of the required wiring and equipment will generally consist of the steps listed below:

- Flag environmental resources and buffers in the field;
- Installation of erosion and sedimentation controls;
- Clearing and rough earthwork to prepare the construction area;
- Establish the construction pad to include the grounding mat, gravel and crushed stone base;
- Establish the new entrance road, if needed, and complete the final grading for the site footprint;
- Construction of the stormwater management areas;
- Placing concrete foundations;
- Installation of the perimeter fence;
- Construction of structures and electric equipment;
- Final electrical installation and testing;
- Connection of electrical lines to new equipment, energizing of the new equipment (commissioning), and;
- Completion of site stabilization and permanent restoration.

Erosion and sedimentation controls will be installed prior to the initiation of any construction or grading activities. Sediment barriers (*i.e.*, erosion control mix, haybales, or silt fence) will be installed between wetlands/water bodies and all disturbed areas unless land contour conditions slope away from these resources.

Clearing and earthwork will begin after the installation of the erosion controls. Construction roads will be established to each new site. Existing entrance roads will be used as appropriate. New roads will be graded, filled, drainage established and put into service. Earthwork to accommodate the proposed substation construction and expansion will begin. Earthwork will involve the use of heavy equipment including excavators, bulldozers, and dump trucks to grub the proposed zone of expansion and place clean fill. The limits of the proposed work zone will be clearly staked before the commencement of activities. Although blasting is not anticipated, some controlled blasting may be required if bedrock is encountered. If blasting is required, proper safeguards will be employed to protect personnel and property in the vicinity of the blasting. Areas with vegetation, such as forested upland and wetland areas, will be cleared and grubbed. Trees and shrubs will be disposed of or chipped on site, consistent with the Maine Slash Law. The site will be graded and fill added as needed to build the site up to the necessary elevations to establish drainage and a level building surface. Components of the stormwater management systems will be graded and established as site grading is completed. Drainage will be maintained and culverts installed as needed.

Once the site has been established, concrete foundation placement will be installed to create pads for the new substation equipment. These concrete pads will be constructed to engineering specifications and will not cause erosion and sedimentation issues. New chain link fencing meeting CMP specifications will be installed around the perimeter of the substation. The bulk of the electrical equipment including transformers, termination structures, switchgear, circuit switchers, regulators, reclosers, and the control house, will be installed after the main footings and structures are in place. All of this work will be completed within the fenced substation footprint.

Disturbed soils within 100 feet of wetlands will be stabilized through mulching and establishing native vegetation in accordance with CMP's Environmental Guidelines, further discussed in Section 3.24 and Exhibit G. Allowing native vegetation to regenerate naturally will be the primary method for establishing permanent vegetation. Areas of exposed soils in uplands will be mulched with hay and those in wetlands may be mulched with weed-free straw. Any construction debris (litter, hardware, and bracing) will be removed from the site and disposed of at a licensed disposal facility. No construction debris or any other materials will be burned or buried at the project site. Erosion and sedimentation controls will be installed as needed and maintained through the duration of construction and restoration efforts. Inspections will occur periodically and after rain events, until permanent stabilization and revegetation has been established, at which time the erosion and sedimentation controls will be removed.

3.23. MAINTENANCE AND OPERATION

Regular maintenance and inspections will be performed after construction is complete and during the life of the NECEC to ensure continued reliability. If deficiencies are found during an inspection, CMP will access the transmission corridor via existing easements and, if applicable, will notify adjacent landowners. Occasionally, emergency maintenance is required and CMP typically responds expediently to return the line to functionality. Planned and emergency maintenance will be performed so that these activities do not adversely impact protected natural resources or violate water quality standards.

Vegetation within developed CMP transmission line corridors is managed in accordance with CMP's Post Construction Vegetation Maintenance Plan, dated August 2016 (Exhibit H). The goals of CMP's vegetation maintenance activities are to: (1) maintain the integrity and functionality of the transmission lines, (2) maintain access in case of emergency and planned repairs, and (3) facilitate safety inspections. More frequent vegetation management may be required within the first 3 to 4 years following construction in order control capable species. After this initial management period, maintenance practices are typically conducted on a four year cycle. Maintenance may be required less frequently in the long-term as vegetation within the corridor becomes dominated by shrub and herbaceous species. Large branches that overhang the transmission line corridor and any hazard trees on the edge of, or outside of, the transmission line corridor that could contact the electrical lines or come within 15 feet of a conductor may be removed as soon as they are identified.

Vegetation maintenance will be accomplished using an integrated vegetation management strategy combining hand-cutting and selective herbicide applications. Protection of sensitive natural resources during vegetation maintenance activities will occur by: using flagging or GPS to locate resources prior to maintenance; hand-cutting within buffers and sensitive areas; avoiding equipment access through wetlands and over streams as much as practicable by utilizing existing public or private roads with landowner approval where required; avoidance or minimization of access in uplands with saturated soils to avoid rutting or other ground disturbance, repair of any damage to wetlands or stream banks; and stabilization and reseeding of any areas of soil disturbance following the completion of maintenance activities.

Substation facilities will be operated and maintained in a manner consistent with good utility practices, including bimonthly on-site substation inspections, quarterly inspection of stormwater management system components, and maintenance of these components as needed. Stormwater components to be inspected and maintained include: infiltration buffers; stormwater conveyance swales and plunge pools associated with the substation yard; level spreaders; culverts with inlet and outlet protection; permanent access road to the site; substation yard (crushed stone) and revegetated areas and embankments. A Stormwater Management System Inspection & Maintenance Log will be retained for each facility.

3.24. ENVIRONMENTAL PROTECTION MEASURES

Large-scale areas exposed to precipitation during construction have the greatest potential for significant sedimentation of a resource. Linear transmission line projects face unique challenges as site conditions, protected natural resource occurrences and types, soil conditions, and weather may vary widely throughout a project. The NECEC will develop an erosion and sedimentation control (ESC) plan as required by the MDEP regulations. The ESC plan will be based on CMP's Environmental Guidelines (Exhibit G).

These guidelines, used as a routine part of all transmission and substation projects, contain effective and proven erosion and sedimentation control requirements, standards, and methods that will protect soil and water resources during construction of the various NECEC components. The manual is largely based on, and has been developed to be consistent with, MDEP best management practices, MDEP's Erosion and Sedimentation Control Law (38 M.R.S. § 420-C), MDEP's Stormwater Management Law (38 M.R.S. § 420-D) and rules (Chapter 500), and Maine Slash Law (12 M.R.S. § 9333), and contains specific best management practices appropriate for electric transmission line and substation construction.

The primary goals of erosion and sedimentation control plans are to minimize soil movement and loss, preserve the integrity of environmentally sensitive areas, and maintain existing water quality. The CMP guidelines provide CMP personnel, their representatives and contractors with a single, cohesive set of erosion control specifications for the NECEC. These guidelines are designed to provide specifications for the installation and implementation of soil erosion and sedimentation control measures while allowing adequate flexibility for application of the most appropriate measures based on site-specific conditions. CMP personnel and their representatives will ensure that the procedures contained in these guidelines are followed by regularly inspecting all work and requiring corrective action if and when necessary.

Implementation of the following practices is required to achieve the goals of the ESC plan:

- Minimize the extent and duration of soil disturbance;
- Protect exposed soil by diverting runoff to stabilized areas;
- Install temporary and permanent erosion control measures (including installation prior to any site disturbance, up to and including final site restoration); and
- Establish an effective inspection and maintenance program.

The CMP guidelines includes appendices that contain: definitions of scientific and technical terms; illustrations of proper and improper application of erosion and sedimentation control techniques as a basis for comparison; site-specific erosion and sedimentation control drawings; and other generic and specific references to ensure the proper and adequate implementation of erosion and sedimentation control methods during construction activities.

Specific ESC plans for the Merrill Road Converter Station with specific erosion and sediment control techniques and stormwater controls, will be developed as part of the engineering site design.

Another environmental protection consideration is the proper management of oil, hazardous materials, and waste. CMP's Environmental Control Requirements, dated February 2017 (Exhibit I), establishes overall requirements for properly managing, storing, transporting and using oil and hazardous materials during construction, and for properly managing waste generated during construction. Spill reporting and clean-up requirements are also defined in this document, which was developed in accordance with all applicable local, state, and federal laws and regulations, and is provided to all contractors and subcontractors working on CMP projects.

Post-construction, all oil-containing substations and the DC/AC converter station will have Spill Prevention, Control and Countermeasure (SPCC) plans which identify oil spill prevention, containment, and response actions and equipment.

SECTION 4 ALTERNATIVES TO THE PROPOSED FACILITY

Pursuant to DOE regulations, 10 C.F.R § 205.322(d), an applicant for a Presidential Permit must describe "all practical alternatives to the proposed facility." In doing so, the applicant should be able to demonstrate that the proposed project is preferred compared to practical alternatives, taking into consideration purpose, need and economic feasibility. Additionally, the alternatives are evaluated to determine whether they would be reasonable and environmentally preferable to constructing the project as proposed.

The criteria for evaluation of potential alternatives are:

- Technical feasibility and practicability;
- Significant environmental impacts relative to the proposed project; and
- Meeting the purpose and need of the proposed project.

Potential alternatives to the NECEC are compared against the preferred route on the basis of potential environmental impacts, ownership, landscape, location, and design constraints on the transmission system. This section describes the potential alternatives to the proposed project, including the no-action alternative. The NECEC, as proposed, is superior to each of the alternatives discussed herein.

4.1. NO-ACTION ALTERNATIVE

Not constructing the NECEC is the no-action alternative. In the absence of the NECEC, another transmission project would be needed to fulfill the purpose and need of the Massachusetts RFP. As a result, the NECEC's environmental, visual, historical, and cultural resource impacts would be avoided and removed from consideration. The no-action alternative would not meet the NECEC Project's purpose of delivering 1,200 MW of the clean energy generation sought by the Massachusetts RFP or future solicitations. In the absence of the NECEC, another project would be needed to fulfill the purpose and need of the Massachusetts RFP; this alternative project would have unknown environmental impacts. And, in the absence of NECEC, no other project would fulfill the NECEC's purpose, to deliver 1,200 MW of clean energy generation to Massachusetts via CMP-owned transmission lines located in Maine.

The NECEC is expected to reduce regional CO2 emissions by over one million metric tons per year in Massachusetts. This amount would help achieve the stated goals of the Regional Greenhouse Gas Initiative (RGGI) by reducing the total amount of CO2 emissions from the power sector of the six New England states, and Delaware, Maryland, and New York.

The NECEC's ability to deliver reliable, renewably-generated electricity from Québec will help alleviate the need to build new non-renewable generation plants, and may allow retirement of older, less efficient fossil fueled power plants. The no-action alternative, if no alternative projects are built, would not reduce greenhouse gas emissions, would not enhance electric reliability, particularly in winter months when natural gas supply and transfer constraints have occurred in recent years, and would not reduce the wholesale cost of electricity for the benefit of retail customers across the region.

4.2. DC TRANSMISSION LINE ALTERNATIVE ROUTES

The three DC transmission line routes considered would all meet the purpose and need to deliver clean energy generation from Québec to the New England Control Area. However, when compared to the two potential alternatives, the preferred route for the NECEC corridor is the most economical, and best meets the economic goals and technical objectives with the least impact on the environment, adjacent land uses and surrounding communities.

4.2.1. Criteria for Assessment of Route Alternatives

The DC transmission line route alternatives were first identified through a geospatial desktop analysis, utilizing publicly available Geographic Information System (GIS) data. Alternatives were then evaluated and compared based on a number of parameters (points of comparison). CMP quantified and evaluated the following parameters for comparison, listed in order of generally decreasing priority with respect to transmission line route selection:

- Conserved Lands
- Undeveloped Right of Way
- Clearing
- Stream Crossings

- Transmission Line Length
- NWI Mapped Wetlands
- Deer Wintering Areas
- Inland Waterfowl and Wading Bird Habitat
- Public Water Supplies
- Significant Sand and Gravel Aquifers
- Parcel Count Total

Each of these parameters is described in more detail below.

4.2.1.1. Conserved Lands

CMP's analysis identified the number of distinct parcels in federal, state, municipal, or non-profit ownership that would be crossed, some of which may be subject to conservation-related land use restrictions, and the acreage of conserved lands directly impacted (*i.e.*, acreage cleared or otherwise altered) by the NECEC. Conserved lands include (i) parcels whose rights are partially or entirely owned by the National Park Service (NPS) (*i.e.,* the Appalachian Trail, for which CMP granted NPS an easement) and the Maine Bureau of Parks and Lands and (ii) lands subject to conservation easements that restrict development or otherwise altering the land. These lands are often of high ecological, recreational, and/or aesthetic value. CMP considered and favored transmission line routes that minimized crossings of conserved lands in order to preserve these values.

4.2.1.2. Undeveloped Right of Way

CMP's analysis identified the total length, in miles, of previously-undeveloped transmission line corridor to be developed and considered, and favored transmission line routes that minimized previously-undeveloped land requiring clearing and development as a transmission line corridor, in order to minimize wildlife habitat conversion, loss or fragmentation, and to optimize construction and maintenance efficiency and cost effectiveness.

4.2.1.3. Clearing

CMP's analysis identified the acreage of tree clearing required within the transmission line corridor and considered and favored transmission line routes that minimized tree clearing, in order to minimize habitat conversion-related impacts.

4.2.1.4. Stream Crossings

CMP's analysis identified the number of mapped features listed in the USGS - National Hydrography Dataset (USGS NHD) that would be crossed by the transmission line. CMP considered and favored transmission line routes that minimized stream crossings, in order to minimize unavoidable temporary (construction mat crossings) and permanent (increased insolation) impacts to these resources.

4.2.1.5. Transmission Line Length

CMP's analysis identified the total length, in miles, of new transmission line required and CMP considered and favored transmission line routes that minimized total transmission line length in order to optimize design efficiency and construction and maintenance cost effectiveness, and to reduce overall environmental impacts.

4.2.1.6. NWI Mapped Wetlands

CMP's analysis identified wetlands and water bodies (generally one acre and larger), listed in the National Wetlands Inventory (NWI) maps developed by the USFWS, which would be crossed by the transmission line. CMP considered and favored transmission line routes that minimized crossings of wetlands and water bodies, in order to minimize unavoidable temporary (construction mat crossings) and permanent (habitat conversion, filling) impacts to these resources.

4.2.1.7. Deer Wintering Areas

CMP's analysis identified the number of deer wintering areas listed by the Maine Office of GIS that are crossed by the transmission line, and the acreage of deer wintering areas directly impacted (*i.e.*, acreage cleared or otherwise altered). Preferred winter cover for deer is found in stands of spruce, northern white cedar, and hemlock, which provide optimum cover and snow-carrying capacity. These areas are critical for the survival of deer during the snowy, cold winters of interior Maine. High and moderate value deer wintering areas (DWAs) are also regulated and protected under Maine's Natural Resources Protection Act (NRPA), although NECEC area DWAs have not been assigned values. CMP considered and favored transmission line routes that minimize intersections with DWA, to minimize the need for clearing of woody vegetation within DWAs as a result of construction and maintenance activities.

4.2.1.8. Inland Waterfowl and Wading Bird Habitat

CMP's analysis identified the number of distinct waterfowl and wading bird habitats, and the total acreage listed by the Maine Office of GIS, crossed by the transmission line. Inland waterfowl and wading bird habitats include breeding, feeding, roosting, loafing, and migration stopover areas. Waterfowl habitats are divided behaviorally and seasonally into three categories: breeding habitats, migration and staging habitats, and wintering habitats (MDIF&W 2005b). Inland waterfowl and wading bird habitat (IWWH) is also regulated and protected under Maine's NRPA. CMP considered and favored transmission line routes that minimized intersections with IWWHs, in order to avoid and minimize clearing of vegetation within IWWHs required for transmission line construction and maintenance.

4.2.1.9. Public Water Supplies

CMP's analysis identified the number of public water supplies listed by the Maine Office of GIS and within 500 feet of the transmission line corridor. CMP considered and favored transmission line routes that minimized crossing of public water supplies in order to minimize the potential for any construction-related impacts to these resources.

4.2.1.10. Significant Sand and Gravel Aquifers

CMP's analysis identified the number of significant sand and gravel aquifers identified by the Maine Office of GIS that would be crossed by the transmission line. CMP considered and favored transmission line routes that minimized crossing of significant sand and gravel aquifers, which are, or may be, used as private or public water supplies, to minimize the potential for any construction-related impacts to these resources.

4.2.1.1. Parcel Count Total

CMP's analysis identified the number of land parcels for which CMP would require the acquisition of title, right or interest. Title, right or interest is required for both permitting and construction. CMP considered and favored transmission line routes with the highest likelihood of successful land rights acquisition, and utilized the number of parcels for which it would need title, right or interest as one indicator of this.

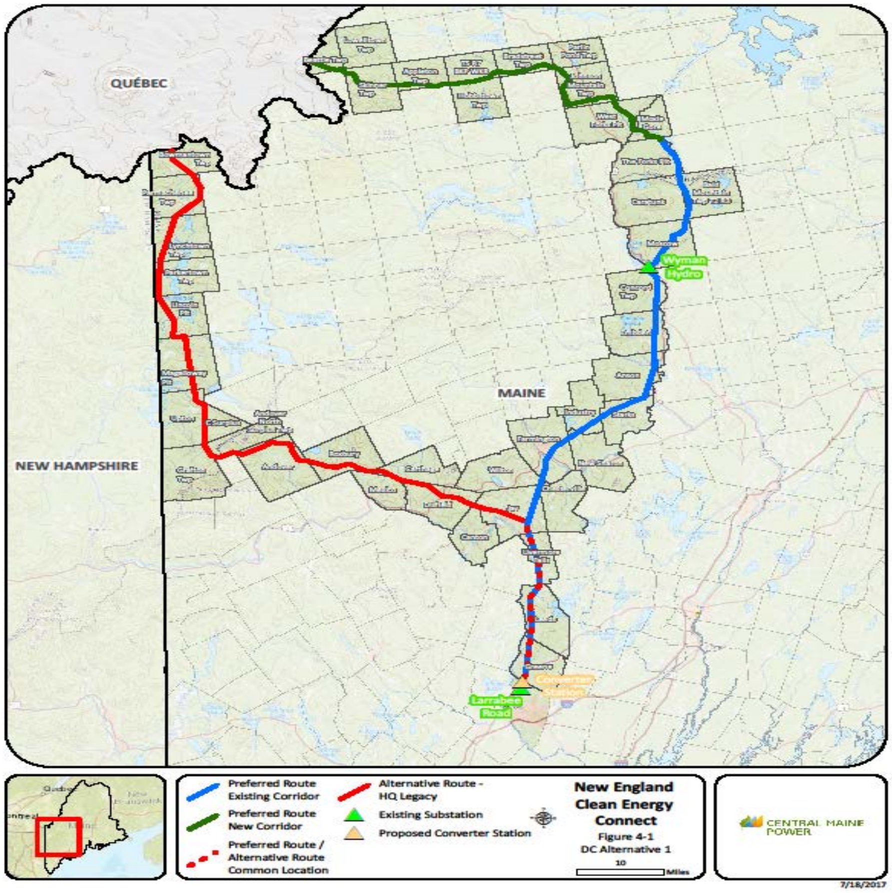
A description of the routing alternatives to the DC transmission line is provided below.

4.2.2. DC Alternative 1

4.2.2.1. 1980s Québec Corridor Description

DC Alternative 1 (Alternative 1) is based on CMP's attempt to acquire and permit a transmission line project from Québec to the Lewiston, Maine area in the late 1980s. At that time, CMP had acquired title, right, or interest, primarily through real estate option agreements, on a significant portion of this corridor. However, the Maine Public Utilities Commission did not approve this project and the options have since expired. This corridor would extend from the Canadian border in western Maine approximately 119.3 miles to an interconnection point in Lewiston, Maine (see Figure 4-1). This line would be located primarily in a new corridor and partially in undeveloped width in existing corridors.

Figure 4-1



Alternative 1 begins in Bowmantown Township, Oxford County, Maine at a point on the Maine/Québec border about 0.75 mile east of the Maine/New Hampshire line. The corridor extends southerly through Bowmantown Township, Parmachenee Township, Lynchtown Township, Parkertown Township and Lincoln Plantation, all in Oxford County. The corridor is west of Parmachenee Lake and Aziscohos Lake. In Lincoln Plantation the corridor crosses Route 16 approximately 0.75 mile west of the bridge across the Magalloway River and then crosses the Magalloway River. At the south line of Lincoln Plantation, the corridor turns east for about 1.25 miles and then south across Magalloway Plantation, Oxford County, following the west property boundary of an industrial forest landowner to the south line of Magalloway Plantation. The entire eight miles across Magalloway Plantation is now subject to a conservation easement held by the New England Forestry Foundation, so a realignment to cross other properties would be necessary in this area.

From Magalloway Plantation the corridor continues south across the town of Upton, Oxford County, crossing the Rapid River about 0.5 mile south of the outlet of Pond-in-the-River. In the 1980s the land along the Rapid River was owned by an affiliate of CMP. That land and additional land on each side of the river is now controlled by the Rangeley Lakes

Heritage Trust and the MDIFW and is subject to a conservation easement. Obtaining rights for a transmission line through this conservation easement is highly unlikely.

South of the Rapid River the corridor runs southeast to C Surplus Township, Oxford County, and then turns south following the west line of C Surplus Township to the southerly line of the township. C Surplus Township is now subject to a conservation easement held by the New England Forestry Foundation; therefore the alignment would need to be moved to the east line of Upton Township. From C Surplus, the route follows the westerly line of Andover North Surplus or the east line of Grafton Township, both in Oxford County, for about two miles before turning east to the southerly line of Andover North Surplus and the west line of the Appalachian Trail Corridor. No records could be located to determine how CMP planned to cross the Appalachian Trail corridor on the circa 1985 project.

From the easterly line of the Appalachian Trail corridor the Alternative 1 corridor follows the southerly line of Andover North Surplus for about a mile before turning east and crossing into the town of Andover, Oxford County where the corridor roughly follows the north and then east town lines before crossing into the town of Roxbury, Oxford County. The corridor crosses Route 120, the Swift River and Route 17 in the southeast part of the town and then exits Oxford County, entering Franklin County for about three miles in the town of Carthage before reentering Oxford County on the north line of the town of Mexico. In less than 0.75 mile, the Alternative 1 corridor crosses the Webb River and into the town of Dixfield, Oxford County where the corridor continues southeasterly across Dixfield, crossing US Route 2 before crossing the east line of the town into the town of Jay, Franklin County. Continuing southeasterly across the town of Jay and the very northern tip of the town of Canton, Oxford County, the corridor crosses Route 4 and then Route 133 before connecting with the Section 278 corridor about 2.25 miles north of the Livermore Falls Substation. From the point of intersection with Section 278 south to Larrabee Road Substation, a distance of approximately 26 miles, Alternative 1 is the same as the Preferred Route.

4.2.2.2. DC Alternative 1 Comparison

Table 4-1, below, compares the NECEC Preferred Alternative to Alternative 1.

Table 4-1. DC Alternative 1 Comparison Summary			
Point of Comparison	***Unit***	***Preferred Alternative***	***Alternative 1***
Conserved lands	no./acres	6 parcels/42 acres	8 parcels/275.3 acres
Undeveloped ROW	miles	53.5	93.1
Clearing	acres	1,823	1,934
Parcel count total	no.	7	120
Stream crossings	no.	115	88
Transmission line length	miles	146.5	119.3
NWI mapped wetlands	no./acres	263 wetlands/76.3 acres	238 wetlands/118.3 acres
Deer wintering areas	no./acres	8 DWAs/44.3 acres	8 DWAs/71.3 acres
Inland waterfowl and wading bird habitat	no./acres	12 IWWH/22.7 acres	9 IWWH/23.1 acres
Public water supplies within 500 feet	no.	1	1
Significant sand and gravel aquifers	no.	12	7

4.2.2.2.1. Conserved Lands

The Preferred Alternative crosses fewer conserved land parcels, and significantly less conserved lands acreage than Alternative 1, indicating that the Preferred Alternative would cause less habitat fragmentation than Alternative 1.

A crossing of the Appalachian Trail would be required by both routes. An overhead crossing of the Appalachian Trail on Alternative 1 would require the acquisition of an easement and a 150 foot wide swath of tree clearing across the trail corridor where no transmission line corridor currently exists. In comparison, the Preferred Route crosses the Appalachian Trail in an existing transmission line corridor and is next to an existing gravel road. CMP owns the AT on Section 222. CMP acquired the rights in fee circa 1950. It later conveyed an easement to the NPS, but kept the fee ownership and specifically the right to construct overhead electric transmission and communication lines for the entire 300 foot wide corridor when the NPS purchased the trail corridor. CMP would only require an additional 75 feet of tree clearing for the installation of the overhead transmission line for the Preferred Route.

4.2.2.2.2. Undeveloped Right of Way

Alternative 1 would require 93.1 miles of new corridor, compared to 53.5 miles of new corridor for the Preferred Alternative, an increase in 39.6 miles of currently undeveloped ROW.

4.2.2.2.3. Clearing

Although Alternative 1 is shorter in overall length than the Preferred Route, Alternative 1 would require an additional 111 acres of tree clearing compared to the Preferred Alternative.

4.2.2.2.4. Parcel Count Total

The Alternative 1 corridor would require CMP to acquire title, right, or interest in 120 parcels of land. In contrast, the Preferred Route requires the acquisition of rights in only seven parcels. CMP has secured six of the seven parcels and is currently negotiating and has a letter of intent to lease the remaining parcel (the Passamaquoddy Tribe-owned two acre parcel in Lowelltown).

4.2.2.2.5. Stream Crossings

The USGS NHD identified more stream crossings along the Preferred Route than Alternative 1, likely a function of transmission line corridor length. CMP standard construction practice is to install temporary equipment spans over streams and to avoid all in-stream activities. Consequently, the primary potential impacts to stream habitat are sedimentation and insolation. CMP mitigates the potential for these impacts by installing erosion and sedimentation controls, by routine cleaning of temporary crossing (construction mats) spans, and by maintaining riparian buffers. As a result, impacts to streams on either route would be insignificant.

4.2.2.2.6. Transmission Line Length

The Alternative 1 transmission line corridor is 119.3 miles in length; about 27.2 miles shorter than the Preferred Route. Alternative 1, in comparison to the Preferred Route, would require 93.1 miles of new corridor, an increase in 39.6 miles of new corridor.

4.2.2.2.7. NWI Mapped Wetlands

A comparison of mapped NWI wetlands along Alternative 1 and the Preferred Route identified twenty-five more wetlands along the Preferred Route. However, construction in the Alternative 1 corridor would result in an additional 42 acres of wetland impact when compared to the Preferred Route. The primary impact to wetlands from construction of the project will be the conversion of forested wetland to early successional scrub-shrub and meadow cover types. As a result, other than a minor amount of permanent fill associated with structures placed in wetlands where no siting alternatives are available, the permanent loss of wetlands from construction of the project on either route is negligible.

4.2.2.2.8. Deer Wintering Areas

The Preferred Route would cross 8 deer wintering areas (DWAs) and would require the conversion of 44.3 acres of DWA habitat. In comparison, Alternative 1 would also cross 8 DWAs, but would require the conversion of 71.3 acres of DWA habitat.

4.2.2.2.9. Inland Waterfowl and Wading Bird Habitat

The Preferred Route would cross 12 IWWHs and require the conversion of 22.7 acres of IWWH habitat, while Alternative 1 would cross 9 IWWHs and would require the conversion of 23.1 acres of IWWH.

4.2.2.2.10. Public Water Supplies

One public water supply is located within 500 feet of both the Preferred Route and Alternative 1.

4.2.2.2.11. Significant Sand and Gravel Aquifers

Impacts from the construction and operation of a transmission line are unlikely to impact aquifers due to the short duration of equipment operation and the implementation of environmental controls, and spill reporting and cleanup procedures utilized by CMP and its contractors during construction.

4.2.2.2.12. Preferred Alternative vs. Alternative 1 Summary

A comparison of the environmental resources traversed by both routes does not substantively differentiate the two routes in terms of overall number of resources impacted. However, when assessing the extent of impact, the conversion of habitat is much greater along the Alternative 1 route than the Preferred Route.

Alternative 1 transmission structures would be visible from Black Mountain Ski Area in the town of Rumford, Maine, Rapid River in Upton, and Aziscohos Mountain in Lincoln Plantation as well as from the Appalachian Trail. The Preferred Route is comparatively advantageous in that it would cross the Appalachian Trail in a location with an existing overhead transmission line corridor.

Alternative 1 would require the acquisition of 120 parcels of private land in addition to rights needed to cross conservation lands. Additionally, 93.1 miles of Alternative 1 consists of a new corridor with no land rights under agreement, controlled or owned by CMP.

For these reasons, CMP does not consider Alternative 1 to be a viable alternative when compared to the Preferred Route.

4.2.3. DC Alternative 2

4.2.3.1. Bigelow Corridor Description

DC Alternative 2 (Alternative 2) would extend from the Canadian border in western Maine approximately 138.5 miles to an interconnection point in Lewiston, Maine (see Figure 4-2). The line would be located partially in a new corridor and partially in undeveloped width in existing corridors.

The alternative route corridor begins in western Maine in Beattie Township, Franklin County, Maine at a point on the Canadian border approximately 2.5 miles north of the southwest corner of the township. The alternative corridor extends southeast along the Preferred Route for approximately 7.75 miles across Beattie Township, the southwest corner of Lowelltown Township and southerly across Skinner Township to a point where the Preferred Route turns east. The Preferred Route corridor has been acquired therefore no additional acquisition would be necessary in the first 7.75 miles of Alternative 2. Both routes require the acquisition by lease of the Lowelltown parcel from the Passamaquoddy Tribe.

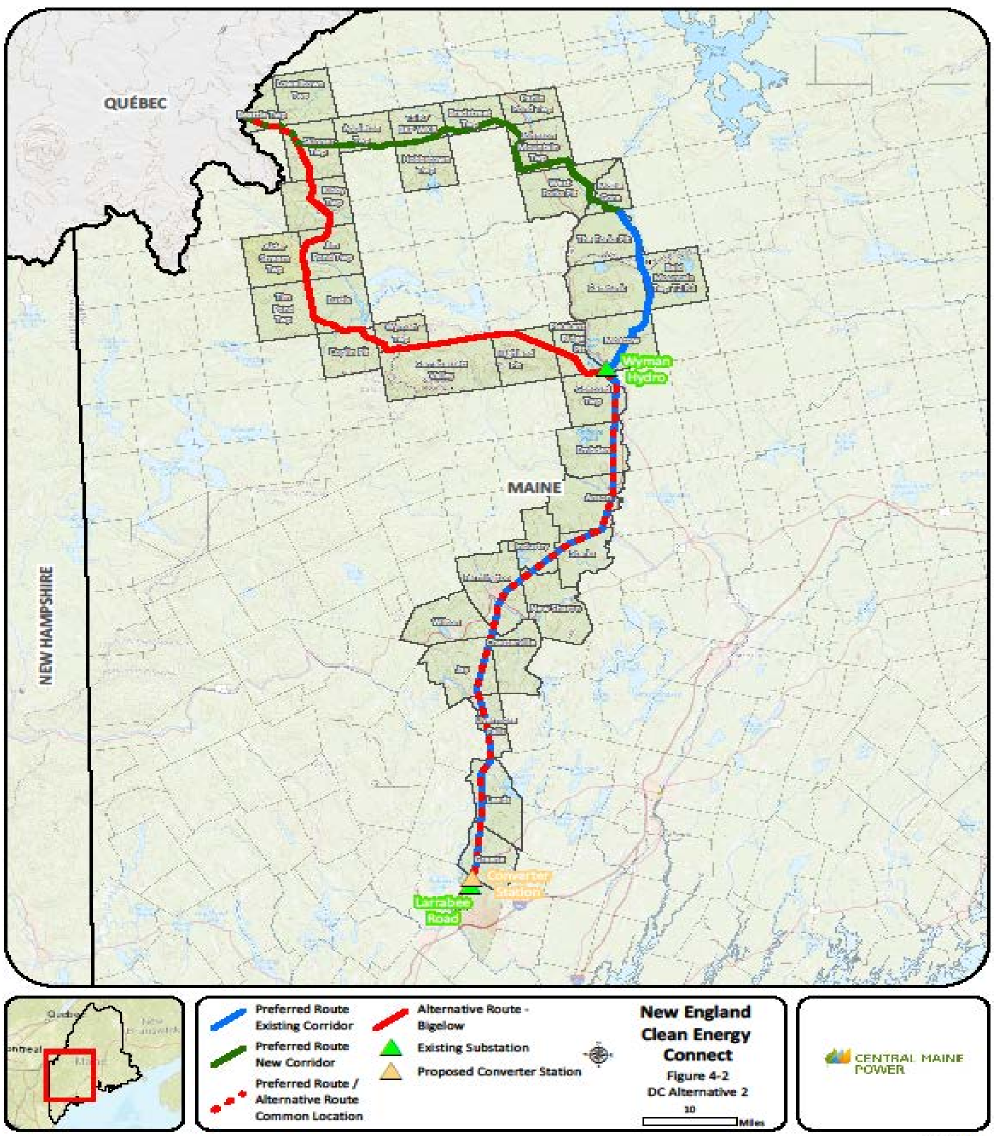
Alternative 2 continues southerly approximately 8.75 miles to a point in Kibby Township, Franklin County, where the corridor begins to parallel the Kibby Mountain Wind Farm 115kV generation lead line. Elevations range from 1,900 feet near the intersection with the generator lead to just under 2,700 feet. The Alternative 2 corridor parallels the generator lead south across Kibby Township, Jim Pond Township, the town of Eustis and Coplin Plantation, all in Franklin County. The 115kV generator lead from the Stratton Energy biomass plant begins to parallel the Kibby generator lead in Coplin Plantation and both lines continue to parallel the Alternative 2 corridor southeasterly across Coplin Plantation and Wyman Township to the Bigelow Substation located on the east side of Route 27 along the north line of the town of Carrabassett Valley.

Alternative 2 parallels the generator lead for a total distance of approximately 27.5 miles. Elevation ranges from about 1,250 feet to about 1,900 feet on this portion of the alternative. The Alternative 2 corridor from the Preferred Route to Bigelow Substation would require the acquisition of a 150 foot wide corridor. This section of new corridor would be located parallel to, but would not overlap, the existing generator lead corridor. It likely is not possible to overlap the Alternative 2 corridor and the Kibby generator lead corridor because of engineering issues. Thus, development of Alternative 2 would result in a new full width corridor adjacent to the existing corridor in this location.

The surrounding land generally is industrial forest land typified by spruce-fir and northern hardwoods forest types that are owned and managed for timber production. Most of the area is undeveloped with only a few seasonal dwellings. Recreation is typically permitted on the industrial forest lands. The Village of Stratton is located about 0.25 miles east of the alternative corridor but the corridor does not impact any residential areas. There is one industrial wind farm located in Kibby Township, and both a biomass generation plant and a saw mill are located in Stratton.

The Alternative 2 corridor crosses Route 27 twice and Route 16 once. Generally, access would need to be obtained over private roads. The alternative corridor crosses the Appalachian Trail on the north side of the Wyman/Carrabassett Valley town line. Overhead rights were obtained from the U.S. Department of the Interior (DOI) for the Stratton Energy generator lead circa 1985. However, DOI refused to grant rights to cross the AT, either overhead or underground, for the Kibby Wind generator lead circa 2010 and the generator lead was placed underground in the Route 27 highway right of way. Obtaining a Special Use permit from the NPS to cross the Appalachian Trail corridor with an overhead line is highly unlikely. The cost and complexity of an underground crossing, whether buried roadside in the Route 27 right of way or placed underneath the Appalachian Trail corridor via directional bore, would pose a financial and engineering challenge compared to the Preferred Route.

Figure 4-2



Starting at the Bigelow Substation, the Alternative 2 corridor would be co-located for approximately 23.5 miles with CMP's Section 215 corridor, which crosses Carrabassett Valley, Franklin County, Highland Plantation and Pleasant Ridge Plantation, Somerset County. Elevation ranges from about 1,100 feet to about 1,900 feet for this portion of the alternative.

Section 215 is a 115kV radial line[10] built on H-frame structures in a 150 foot wide corridor. For approximately 9.5 miles, the Section 215 corridor is located along the north line of Carrabassett Valley which is also the south line of the Bigelow Preserve, a large Maine-owned tract with strict land use restrictions designed to limit development. A one mile long portion of the Bigelow Preserve extends across the Section 215 corridor. Section 215 originates at Wyman Hydro and terminates at Bigelow substation. There is no other CMP 115 kV line connected to Bigelow substation so the loss of Section 215 could put the entire load and generation serviced by this substation in jeopardy.

Most of the eastern half of Carrabassett Valley is owned by the Penobscot Indian Nation. Most of the land in Highland Plantation and Pleasant Ridge Plantation is industrial forest land although there are smaller tracts of private forest ownership and some residential development along Rowe Pond Road in Pleasant Ridge, which is crossed twice by Section 215. The acquisition of an additional 75 feet of width would generally be necessary to co-locate with the Section 215 corridor. However, acquiring additional width through the Bigelow Preserve would be very difficult or impossible due to significant land use restrictions in the Preserve. Therefore, Alternative 2 would need to be either double circuited with Section 215, placed underground or rerouted southerly around the Bigelow Preserve ownership. Given the probable need to cross the Appalachian Trail underground, the difficulty in taking Section 215 out of service because it is a radial line (*i.e.*, there is no other transmission route from this area if this line is de-energized) and the expected visual impacts of Alternative 2, CMP anticipates that regulators would require the Alternative 2 line to be installed underground from the north side of the Appalachian Trail corridor to the Highland Plantation town line, a distance of about ten miles. Because underground transmission line construction costs approximately four times that of overhead construction, this represents a significant additional expense.

A new corridor approximately 0.75 mile long will be necessary to connect between the Section 215 corridor in southeastern Pleasant Ridge Plantation and the Section 63 corridor in northeastern Concord Township. This segment of the Alternative 2 corridor would need to be 150 feet wide.

From the point of intersection with the Section 63 corridor, which is approximately 0.75 mile south of the Wyman Dam, Alternative 2 would follow the preferred route to Larrabee Road Substation.

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[10] A radial line is a transmission line that terminates without connecting with another line of same or higher voltage that is part of the grid.

4.2.3.2. Alternative 2 Comparison

Table 4-2, below, compares the NECEC Preferred Alternative to Alternative 2.

Table 4-2. DC Alternative 2 Comparison Summary

Point of Comparison	***Unit***	***Preferred Alternative***	***Alternative 2***
Conserved lands	no./acres	6 parcels/42 acres	9 parcels/53.2 acres
Undeveloped ROW	miles	53.5	17.3
Clearing	acres	1,823	1,670
Parcel count total	no.	7	34
Stream crossings	no.	115	123
Transmission line length	miles	146.5	138.5
NWI mapped wetlands	no./acres	263 wetlands/ 76.3 acres	283 wetlands/ 113.3 acres
Deer wintering areas	no./acres	8 DWAs/44.3 acres	8 DWAs/44 acres
Inland waterfowl and wading bird habitat	no./acres	12 IWWH/22.7 acres	12 IWWH/16.5 acres
Public water supplies within 500 feet	no.	1	1
Significant sand and gravel aquifers	no.	12	10

4.2.3.2.1. Conserved Lands

The Preferred Route and Alternative Route 2 both cross conserved land parcels. However, Alternative 2 would traverse three additional conserved parcels, resulting in 11.2 acres of additional impact to land held in conserved lands compared to the Preferred Route. Alternative 2 would require crossing the Appalachian Trail on Route 27 in the town of Wyman. An overhead or direct bore underground crossing of the Appalachian Trail on Alternative 2 would require the acquisition of an easement from the NPS and an overhead crossing would require a 150 foot wide swath of tree clearing across the trail corridor where no transmission line corridor currently exists. Otherwise, underground installation of the DC transmission line would be required within the ROW of State Highway 27. Both of these options are expensive. In comparison, the Preferred Route crosses the trail corridor within an existing transmission line corridor and is adjacent to an existing gravel road. CMP owns the land where the AT is located on Section 222. CMP acquired the rights in fee circa 1950. It later conveyed an easement to the NPS, but kept the fee ownership and specifically the right to construct overhead electric and communication transmission lines for the entire 300 foot wide corridor when the NPS purchased the trail corridor. CMP would only require an additional 75 feet of tree clearing for the installation of the overhead transmission line for the Preferred Route.

4.2.3.2.2. Undeveloped Right of Way

The Preferred Route would require 53.5 miles of currently undeveloped right of way to be developed, compared to 17.3 miles of currently undeveloped right of way required for Alternative 2.

4.2.3.2.3. Clearing

The Preferred Alternative would require clearing 1,823 acres, compared to Alternative 2 which would require clearing 1,670 acres.

4.2.3.2.4. Parcel Count Total

The Alternative 2 corridor would require CMP to acquire title, right, or interest in 34 parcels of land. In contrast, the Preferred Route requires the acquisition of rights in only seven parcels. CMP has secured six of the seven parcels and is currently negotiating and has a letter of intent to lease the remaining parcel (the Passamaquoddy Tribe-owned one acre parcel in Lowelltown).

4.2.3.2.5. Stream Crossings

The Preferred Route would cross 115 streams, while Alternative 2 would cross 123 streams. CMP standard construction practice is to install temporary equipment spans over streams and to avoid all in-stream activities. Consequently, the primary potential impacts to stream habitat are sedimentation and insolation. CMP mitigates the potential for these impacts by installing erosion and sedimentation controls, by routine cleaning of temporary crossing (construction mats) spans, and by maintaining riparian buffers. As a result, impacts to streams on either route would be insignificant.

4.2.3.2.6. Transmission Line Length

The Preferred Route transmission line corridor is 146.5 miles, whereas the Alternative 2 transmission line corridor is 138.5 miles.

4.2.3.2.7. NWI Mapped Wetlands

The Preferred Route crosses 263 wetlands and impacts 76.3 acres, whereas Alternative 2 crosses 283 wetlands and impacts 113.3 acres. The primary impact to wetlands from construction of the project will be the conversion of forested wetland to early successional scrub-shrub and meadow cover types. As a result, other than a minor amount of permanent fill associated with structures placed in wetlands where no siting alternatives are available, the permanent loss of wetlands from construction of the project on either the Preferred Route or Alternative 2 is negligible.

4.2.3.2.8. Deer Wintering Areas

Deer wintering areas crossed, and converted, are virtually identical between the Preferred Route and Alternative 2. There is no significant environmental advantage to either route with respect to DWAs.

4.2.3.2.9. Inland Waterfowl and Wading Bird Habitat

The Preferred Route crosses 12 IWWHs and would require conversion of 22.7 acres, while Alternative 2 crosses 12 IWWHs and would require conversion of 16.5 acres. There is no significant environmental advantage to either route with respect to IWWHs.

4.2.3.2.10. Public Water Supplies

One public water supply is located within 500 feet of both routes. There is no significant environmental advantage to either route with respect to public water supplies.

4.2.3.2.11. Significant Sand and Gravel Aquifers

The Preferred Route crosses 12 significant sand and gravel aquifers, while Alternative 2 crosses 10 significant sand and gravel aquifers. Impacts from the construction and operation of a transmission line are unlikely to impact aquifers due to the short duration of equipment operation and the implementation of environmental controls, and the spill reporting and cleanup procedures utilized by CMP and its contractors during construction.

4.2.3.2.12. Preferred Alternative vs. Alternative 2 Summary

Alternative 2, while slightly shorter and containing less new corridor than the Preferred Route, would create more significant environmental impacts as well as severe land acquisition and social impact issues.

Approximately 34 parcels would need to be acquired, including rights across the Penobscot Indian Nation, the Bigelow Preserve and the Appalachian Trail corridor. Past attempts by others, including Highland Wind and Foster Mountain Wind (a/k/a West Hills Wind) to develop transmission and generation in this area have not been successful, due in part to local opposition; therefore the acquisition of private land in these areas is expected to be difficult.

In addition, Alternative 2 transmission structures would likely be visible from points on the Appalachian Trail and other trails on the Bigelow Preserve and from the Sugarloaf Mountain Ski area. Based on recent National Park Service objections to the proposed overhead transmission line associated with the Kibby Mountain Wind generator lead, an overhead crossing near the Appalachian Trail on Route 27 in the town of Wyman is likely to be opposed by the National Park Service and is therefore improbable.

For these reasons, CMP does not consider Alternative 2 to be a viable option when compared to the Preferred Route.

4.3. ALTERNATIVE LOCATIONS TO THE DC TO AC CONVERTER STATION

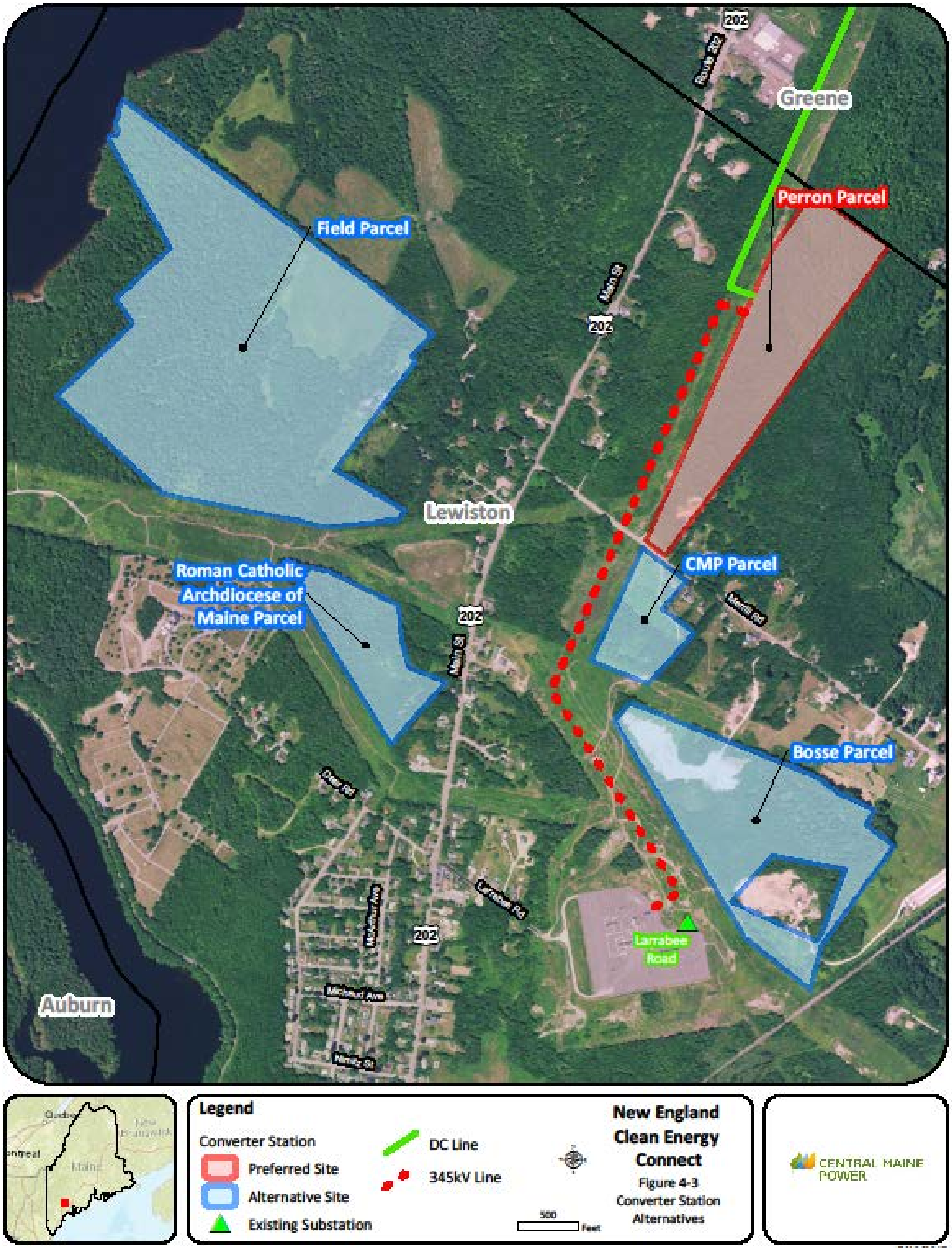
Several sites for the DC to AC converter station were identified and evaluated based on adequacy of land area suitable for the converter station siting, location along the preferred DC transmission route, proximity to the nearest substation capable of interconnection, and potential impacts to the environment and on surrounding land uses (see Figure 4-3).

CMP evaluated six sites (including the Larrabee Road Substation) as possible options for the converter station. The unimproved forested parcel owned by CMP on the south side of Merrill Road and a forested parcel owned by the Roman Catholic Archdiocese of Maine north of Deer Road were ruled out as not being large enough to accommodate the proposed infrastructure. The Larrabee Road Substation was also ruled out for this same reason. The Bosse gravel pit parcel, on the south side of Merrill Road, north of the Larrabee Road Substation has sufficient land area, but the NRCS soil maps indicated ScA (Scantic silt loam, 0-3% slopes) and Pa (Peat and muck) soils throughout the lot. These soils are poorly drained or very poorly drained and therefore reflective of wetlands, and are therefore not preferred from an environmental impact or engineering standpoint.

CMP identified two of the six properties as being most suitable: 1) the Perron parcel (the preferred site) located along the project corridor 0.5 mile north of Merrill Road in Lewiston; and 2) the Field parcel situated along an adjacent transmission corridor (0.6 miles from the project corridor) located at the end of Taylor Hill Road in Lewiston. These two sites are approximately one mile from the Larrabee Road Substation in Lewiston. Both properties contain adequate land area, are located a suitable distance from residential structures, are bordered by significant vegetative buffers, and would allow for interconnection to the Larrabee Road Substation through existing ROWs. However, the Field parcel would require the DC line to extend an additional 0.5 mile, including one DC line crossing of U.S. Route 202 and one crossing of U.S. Route 202 by the 345kV tie to the Larrabee Road Substation. The alternative site on the Field parcel would also require an approximately one mile portion of transmission line Section 61 and Section 255 to be placed on double circuit structures.

Both the Perron and Field parcels contain wetland, but based on existing natural resource data and NRCS soil survey maps, the location of wetlands on the Field parcel would not allow the converter station to be positioned immediately adjacent to the transmission line corridor without significant fill for both the converter station and the road that would access the site. The preferred (Perron) site is positioned directly along the project's DC corridor. There is one mapped significant vernal pool (SVP) on the preferred site, but the six acres required for the converter station can be sited in an upland area outside of the SVP depression and its associated 250 foot critical terrestrial habitat. For these reasons, the alternative site on the Field parcel is less favorable than the preferred Merrill Road Converter Station site on the Perron parcel.

Figure 4-3



Greene
Perron Parcel
Field Parcel
Lewiston
Roman Catholic Archdiocese of Maine Parcel
CMP Parcel
Bosse Parcel
Larrabee Road
Auburn
Main St
202
Legend
Converter Station
Preferred Site
Alternative Site
Existing Substation
DC Line
345kV Line
500
Feet
New England Clean Energy Connect
Figure 4-3
Converter Station Alternatives
CENTRAL MAINE POWER
7/18/2017

SECTION 5 APPROVALS, REGULATORY SCHEDULE, AND PUBLIC OUTREACH

The NECEC will require the following permits and approvals before commencement of construction:

- MPUC Certificate of Public Convenience and Necessity;
- ISO-NE System Impact Study and approval of Market Participant's Proposed Plans (under Section I.3.9 of the ISO-NE Tariff);
- Presidential Permit;
- Siting and natural resources protection approvals and land use and water quality certification, from the MDEP and the LUPC;
- USACE wetland impact permits; and
- Maine municipal approvals.

In addition to the above approvals and permits, FERC has jurisdiction over transmission access, transmission service agreements and transmission service charges, including cost of service based tariffs, use charges and/or support agreements covering transmission services. The NECEC includes a Transmission Service Agreement under which CMP will recover its revenue requirements for the Project. As a result, filings at FERC will be required. Obtaining FERC approval will be done in parallel with state and municipal siting approvals and is not expected to be a critical path item.

This section summarizes these applicable or potentially applicable permitting requirements and approval processes and describes the Applicant's public outreach efforts.

5.1. PERMITTING OVERVIEW

CMP has many decades of experience successfully designing, siting, constructing, and commissioning large and complex transmission line and substation projects while complying with all federal, state, regional, and local zoning and permitting requirements. CMP intends to apply this experience and approach to permitting of the NECEC. CMP will pursue all permits necessary for the NECEC.

Permitting actions will include: outreach to all federal, state and local permit-issuing authorities; surveys and studies of protected and sensitive natural and cultural resources within the NECEC area; comprehensive review of statutes, regulations, local ordinances, and other requirements relevant to permitting; identification of all required environmental and land use permits, licenses and other approvals based on project scope, location, and natural resource impacts; research and documentation of all permit application processes (information requirements, approval standards and criteria, timeline, fees, other); preparation of permit applications; presentation of applications to the appropriate permitting authorities; ongoing consultation with natural resource and permitting agencies and authorities; timely responses to agency requests for information; negotiation of permit terms and conditions; and procurement of all required approvals.

5.2. OTHER FEDERAL AUTHORIZATIONS AND APPROVALS

5.2.1. U.S. Army Corps of Engineers Permits

Pursuant to Section 10 of the Rivers and Harbors Act of 1899 (RHA), 33 U.S.C. Section 403, and Section 404 of the Clean Water Act, 33 U.S.C. Section 1344, USACE will issue a permit authorizing certain aspects of construction of the Project. Section 10 of the RHA requires USACE approval prior to the commencement of construction activities in navigable waters of the United States. CWA Section 404 requires USACE approval prior to discharging dredged or fill material into jurisdictional waters of the United States, including many wetlands. Review of these applications occurs concurrently with the MDEP process described below. The USACE does not have permit review, processing, and issuance timeframe requirements. In practice, however, Section 404 permits are generally issued in less than one year, provided that the applications are complete and acceptable for processing. Therefore, the NECEC is expected to receive authorization from the USACE prior to issuance of the Presidential Permit.

CMP conducted a pre-application meeting with USACE and other state and federal agencies on May 23, 2017. CMP continues to actively engage these agencies.

5.2.2. U.S. Fish and Wildlife Service

Although no USFWS permits are required, CMP conducted a pre-application meeting with USFWS and other state and federal agencies on May 23, 2017. As part of the USACE authorization process described above, the USFWS will act as a consulting agency in matters concerning RTE species and habitats. CMP continues to actively engage these agencies.

5.3. MAINE AUTHORIZATIONS AND APPROVALS[11]

5.3.1. Maine Public Utilities Commission

The NECEC will require a Certificate of Public Convenience and Necessity (CPCN) from the MPUC. CMP expects to petition the MPUC for a CPCN in October, 2017. To grant a CPCN, the MPUC must find that a public need exists for the transmission facility, taking into account, at a minimum, economics, reliability, public health and safety, scenic, historic and recreational values, state renewable energy generation goals, the proximity of the proposed transmission line to inhabited dwellings and alternatives to construction of the

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[11] The Maine Authorizations and Approvals also will address the network upgrade facilities that are beyond the scope of this Presidential Permit Application, but are required to ensure delivery of increased power to the ISO-NE power grid at Larrabee Road Substation.

transmission line, including energy conservation, distributed generation, and load management.[12] CMP's petition to the MPUC will address each of these points, and the CMP's relevant subject matter experts will offer testimony under oath addressing these requirements.

The MPUC will permit interested parties, including the Maine Office of Public Advocate and affected landowners, to participate in the CPCN proceeding, which will include discovery and public hearings as necessary and appropriate.

The MPUC is required by Maine law to issue its order on the CPCN petition within nine months after the petition is filed unless the petitioner agrees to an extension or the Commission finds that additional time is warranted under the circumstances. CMP expects that the MPUC will grant the CPCN in an expeditious manner.

5.3.2. Maine Department of Environmental Protection

MDEP is responsible for processing requests for several permits and approvals within organized areas of the State of Maine. These permits and approvals include those required by the following laws:

- Site Location of Development Act (SLODA), which regulates developments of state or regional significance that may substantially affect the environment (38 M.R.S. §§ 481 *et seq.*).
- Stormwater Management Law (38 M.R.S. §420-D)
- Natural Resources Protection Act (NRPA) (38 M.R.S. §§ 480-A, *et seq.*).
- Waste Discharge Law, for Maine Construction General Permit (38 M.R.S. §§ 413 *et seq.*).
- Clean Water Act (CWA) Section 401 water quality certification.

MDEP is responsible for determining a developer's compliance with the "no adverse effect on the natural environment" standard of the SLODA (38 M.R.S. § 484(3)). This review includes potential primary, secondary, and cumulative impacts of the project on the character, quality, and uses of the land, air, and water on the project site and on the area likely to be affected by the proposed project, and the potential effects on the protection and preservation of the public's health, safety, and general welfare. In determining that a developer has made adequate provision for fitting a project harmoniously into the existing natural environment and that the project will not adversely affect existing uses, scenic character, and natural resources in the municipality or in neighboring municipalities,

[12] 35-M.R.S. § 3132(6).

SLODA, 38 M.R.S. § 484(3)), identifies several potential project impacts to be evaluated, including:

- Air Quality
- Climate
- Natural Drainage Ways
- Runoff/Infiltration Relationships
- Erosion and Sedimentation Control
- Surface Water Quality
- Ground Water Quality
- Buffer Strips
- Noise
- Historic Sites
- Unusual Natural Areas
- Access to Direct Sunlight
- Scenic Character
- Protection of Wildlife and Fisheries
- Solid Waste Disposal
- Control of Odors
- Sufficient and Healthful Water Supplies

The MDEP's application review processing time frame, within which permits must be issued after applications are deemed complete, is 185 calendar days for SLODA permit applications and 120 calendar days for NRPA permit applications. In practice, however, the MDEP may request agreement to extend the processing time, or the processing time may be extended if MDEP holds a public hearing on the application. The NECEC, however, is expected to receive a determination of no adverse effect on the natural environment by the MDEP prior to issuance of the Presidential Permit.

5.3.3. Maine Land Use Planning Commission Certificate of Compliance

Pursuant to 38 M.R.S. § 489-A-1(2)(D), the LUPC must certify that the parts of the proposed project in the unorganized and deorganized areas of the state (*i.e.*, areas with no local government) meet the land use standards established by that commission that are not considered in the MDEP's review of the applications listed immediately above.

The MDEP and LUPC share jurisdiction in the unorganized and de-organized areas of the state, to the extent provided in the SLODA. LUPC certification will be considered by the LUPC concurrent with the MDEP's review of CMP's SLODA and NRPA permit applications.

The following areas are within the LUPC's jurisdiction:

- Appleton Township
- Bald Mountain Township T2 R3
- Beattie Township
- Bradstreet Township
- Concord Township
- Hobbstown Township
- Johnson Mountain Township
- Lowelltown Township
- Merrill Strip Township
- Moxie Gore
- Parlin Pond Township
- Skinner Township
- T5 R7 BKP WKR
- The Forks Plantation
- West Forks Plantation

In May 2017, CMP initiated consultation with the LUPC with respect to approval requirements in the unorganized and deorganized areas along the project corridor. The LUPC statute (Title 12 Chapter 206-A) required the creation of land use districts and standards in the unorganized and deorganized areas of the state. CMP has reviewed the land use subdistricts traversed by the project and has determined that the NECEC is an allowed use in each subdistrict, including those that require special exceptions for utility facilities. Applicable land use standards in LUPC jurisdictional areas, to the extent required for certification to MDEP, will be considered by the LUPC concurrent with the MDEP's review of CMP's SLODA and NRPA permit applications.

5.3.4. Maine Department of Agriculture, Conservation and Forestry

Several routine approvals may be required from the Maine Department of Agriculture, Conservation and Forestry (MDACF), including:

- Leases or other approvals where the Project is located within public lands,

- Leases for submerged lands managed by the Bureau of Parks and Lands (may not be required based on final scope and design).

- Forest Operations Notification where any harvested wood will be offered for sale.

5.3.5. Maine Department of Transportation

The Maine Department of Transportation (MDOT) has jurisdiction over routine road and highway entrance permits for utility projects, including power line installation. CMP will obtain the following permits from MDOT:

- Utility Location and Road Opening Permits (M.R.S. Title 35-A, Chapter 25) will be required for all utility structures and appurtenant facilities to be located within the ROW of any public road or highway, whether in/on the ground (*e.g.*, poles) or aerial (*e.g.*, conductors).

- Driveway/Entrance Permit for construction of new driveway(s) onto state highway or state-aid highway.

5.4. MUNICIPAL AUTHORIZATIONS AND APPROVALS[13]

5.4.1. Municipal Approvals (Local Planning Boards, Zoning Boards of Appeals, and Code Enforcement Officers)

Planning and zoning at the local level in Maine is administered by municipalities, (both cities and towns), in the organized areas of the state, and by the LUPC in the unorganized and deorganized areas of the state (*i.e.*, areas with no local government). CMP plans to initiate local ordinance reviews to determine permitting requirements for each municipality. If a municipal ordinance severely restricts or prohibits construction of the project, CMP will request an amendment of the ordinance. In the event the municipality rejects CMP's request for ordinance amendment or enacts an ordinance that severely restricts or prohibits construction of the project, CMP will petition the MPUC under applicable Maine law for appropriate redress to permit construction of the project. In general, the permitting process will include outreach to the municipal Code Enforcement Officer or Planner to determine permit application requirements, preparation of the permit applications, presentation of applications to the local planning boards or other approval-granting entities, and ultimately issuance of the required approvals. This process typically takes 3 to 6 months to complete. CMP anticipates all required local approvals will be obtained by mid-2019.

[13] The Maine Municipal Authorizations and Approvals also will address the network upgrade facilities that are beyond the scope of this Presidential Permit Application, but are required to ensure delivery of increased power to the ISO-NE power grid at Larrabee Road Substation.

CMP is committed to working collaboratively with all regulatory and permitting entities throughout the duration of the NECEC, from initial planning, design and construction, to commissioning and energizing the transmission facilities. Permits and approvals from the various municipalities may include:

- Shoreland zoning permits;
- Building permits;
- Flood hazard development permits;
- Conditional use / rezoning approvals;
- Site plan / subdivision approvals;
- Driveway/entrance permits;
- Street opening, blasting, and demolition permits; and
- Utility location permits.

Municipalities that may require permits or approvals of the NECEC are:

Alna	Lewiston
Anson	Livermore Falls
Auburn	Moscow
Caratunk	New Gloucester
Chesterville	New Sharon
Durham	Pownal
Embden	Starks
Farmington	Whitefield
Greene	Wilton
Industry	Windsor
Jay	Wiscasset
Leeds	Woolwich

5.5. REGULATORY SCHEDULE

The detailed projected permitting timeline for the NECEC is provided in the project schedule provided as Exhibit J. As described in 5.1 through 5.3, the NECEC requires multiple agency permits and submission of applications for such permits is anticipated to be concluded by October, 2017, as shown in Exhibit J and detailed below.

5.6. PUBLIC OUTREACH

CMP recognizes the importance of public involvement and is committed to transparent and responsive stakeholder engagement. CMP's recent experience with the multi-year MPRP, which impacted over 80 municipalities and approximately 3,000 abutting landowners, demonstrates that on-going communication, early information, access to project details and regular updates about project specifics are instrumental in achieving "public permission" and ensuring timely completion of a major infrastructure project. CMP used these and other best practices on the MPRP and intends to put that same level of effort into public outreach for the NECEC Project. Lessons learned from MPRP and smaller infrastructure projects underscore the need to share information early, and to meaningfully respond to public input.

5.6.1. Communications Plan

With these principles in mind, CMP prepared the NECEC Communications Plan, a copy of which is provided as Exhibit N. The NECEC Communications Plan is presented in three phases:

Phase 1: Pre-filing communication to ensure key stakeholders are well informed and not surprised by CMP's proposal

Phase 2: Post-filing outreach to build project awareness and gather input throughout the permitting process

Phase 3: Construction communication to minimize disruption to communities and neighbors

5.6.2. Outreach Approach

Consistent with CMP's commitment to communicate early, understand issues and try to reasonably mitigate impacts, CMP began quiet conversations in the spring of 2017 with rafting companies, recreation and economic development groups to discuss crossing the Kennebec River. The working group consists of three rafting companies, and one person each from economic development and recreation groups. Three CMP officials, including an AVANGRID Vice President and a representative of the outreach team round out the working group. These discussions have been very productive and mutually respectful. CMP has a long and successful history of working with these groups and anticipates successful resolution of the issues involved.

More broadly targeted conversations were initiated on July 17, 2017 to stakeholders such as municipal and county leaders, energy and economic development interests to inform them about the project and ensure they had accurate information to address constituent questions once the project is formally announced.

CMP will mount a major effort during the balance of 2017 to engage all interested parties through personal meetings, traditional and social media, presentations and community forums. Key stakeholders include state and local officials, town and environmental leaders, residents, landowners, business owners and local vendors. The goals of the communications effort are to provide stakeholders with accurate and timely information about the project; to offer multiple channels for the public to learn about the NECEC; to be transparent; and, whenever possible, to integrate stakeholder input consistent with the obligation to build the project in a timely, environmentally-sensitive and cost-effective manner.

In the late summer/early fall of 2017, public open house meetings will be held in Moscow, Maine (northern region of the project), Lewiston, Maine (southern region) and Wiscasset, Maine (eastern upgrades). These public informational meetings are required under MDEP's Chapter 2 Regulations which address permit application processing requirements. The meetings will be well-publicized through newspapers, bulletins and direct calls to interested individuals or groups. The meetings will feature stations staffed by subject matter experts available to answer questions. More detail on plans for these meetings is provided in Exhibit N. The communications team also intends to support the scoping sessions and public hearings, with exhibits, displays, collateral material and project experts.

During construction, CMP will post regular construction updates on the NECEC website, share them through social media, and provide updates directly to town offices. CMP will implement a complete construction communication plan.

Although the Project will be permitted and constructed entirely in Maine, Massachusetts stakeholders also will require Project information. Ratepayers on whose behalf the RFP was issued can be expected to evaluate the environmental and community impacts of all projects vying for selection in this process. Therefore, CMP plans to make information available to engaged stakeholders in Massachusetts as well as Maine.

5.6.3. Stakeholders

A Maine stakeholder list is included in Exhibit O. Stakeholder categories include:

- Elected officials – state, county and municipal
- Economic and energy-related associations
- Conservation and environmental groups
- Sportsman

- Outdoor recreation interests including rafting companies
- Vendors

5.6.4. Outreach Methods

Communications methods include:

- Direct one-on-one conversations and follow-up meetings;
- Events with clean energy and business leaders in Maine and Massachusetts;
- Community outreach and publicized local meetings along the project route and in Massachusetts
- Schedule, provide public notice and host a public information meeting as required by SLODA;
- Meetings with user groups and landowners
- Public information sessions in three communities centrally located in the project area
- Presentations at town and county offices, association meetings and service clubs
- A targeted media effort and scheduled interviews with key reporters to facilitate accurate and timely coverage.

The NECEC public-facing communication tools described in this plan are as follows:

- Website
- Project brochure
- Project maps
- Q&A
- Presentation
- Posters
- Video
- Economic impact summary
- Facebook and Twitter accounts
- Telephone hotline
- E-newsletter
- Information packets
- News releases
- Media folders
- Testimonials
- Informational ads
- Public and legal notices
- Project newsletter
- Field cards

The NECEC internal analysis, data bases and activity tracking devices in use include:

- Routing analysis
- Stakeholder database
- Stakeholder contact plan
- Activity tracker
- Background reports
- NECEC By-The-Numbers
- Message manual
- CMP community tax history report
- Project investment per town and county

Project materials that have been prepared to date to facilitate these communications are provided in Exhibit O, including:

- Project Brochure
- Project Map
- Q&A

The response to the Project so far has been overwhelmingly positive, both in Maine and Massachusetts. These are the attributes of NECEC stakeholders to date seem to care about most:

- By hosting this Project, Maine enjoys lower energy costs, thousands of jobs during construction, new tax revenues and cleaner air, all with minimal impacts to the environment.

- Building on regional investments in the bulk power system captures value for ratepayers and enables cost-effective delivery of clean energy.

- The new portion of the transmission corridor almost entirely avoids sensitive environmental, recreational and scenic resources, including state and national parks.

- The entire corridor is in single ownership reducing acquisition and permitting uncertainties.

- A renewable energy corridor is compatible and consistent with longstanding uses of commercial forestland, home to biomass, hydropower and wind.

- Maine's largest utility has a major role to play in the region's clean energy future and Maine stakeholders so far are excited about a project with this level of benefits

The initial NECEC outreach effort has resulted in a number of letters of endorsement from key stakeholders. These initial letters are provided as Exhibit P. NECEC anticipates additional letters of support as more stakeholders become familiar with the project and its benefits to the New England region. Most notably, supporters have said:

"The new corridor to bring clean, renewable energy from Quebec has been carefully sited through commercial forest and along an existing transmission corridor in Franklin County. This is a sound approach that will provide the region with significant economic benefits while minimizing environmental impacts. Hydropower is an important energy resource and Maine offers the best path to connect it into the New England grid." Greater Franklin Economic Development Council

"The Maine State Chamber of Commerce supports this proposal wholeheartedly. Although the power is going to Massachusetts, we are confident Maine will recognize the benefits getting dropped off along the way. We will do everything possible to engage and assist as this project goes through the local, state and federal permitting process. Given the location of the corridor and the merits of the proposal, we would not anticipate any difficulty whatsoever in obtaining the necessary permits in a timely manner." Maine State Chamber of Commerce

5.7. VERIFICATION

Verification of this Presidential Permit application is attached as Exhibit F.

EXHIBITS

Exhibit A	**Opinion of Counsel**
Exhibit B	**Drawings of Typical Structure Configurations**
Exhibit C	**General Area Maps – Preferred and Alternative Routes; Segments**
Exhibit D	**Area Map of Border Crossing**
Exhibit E	**System Power Flow Plots (CEII – Redacted from Public Version)**
Exhibit F	**Verification of Application**
Exhibit G	**CMP's Environmental Guidelines**
Exhibit H	**Post Construction Vegetation Maintenance Plan**
Exhibit I	**CMP Environmental Control Requirements**
Exhibit J	**Project Schedule**
Exhibit K	**Technical Reports (CEII – Redacted from Public Version)**
Exhibit L	**Architectural Resources within the Above-Ground Study Area**
Exhibit M	**NRHP Listed and Eligible Cultural Resources**
Exhibit N	**Communications Plan**
Exhibit O	**Public Outreach Materials**
Exhibit P	**Letters of Endorsement**
Exhibit Q	**State and Federal Agency Contact Information**