



September 25, 2020

Mr. James R. Beyer
Regional Licensing and Compliance Manager
Bureau of Land Resources
Maine Department of Environmental Protection
17 State House Station
Augusta, ME 04333-0017

RE: New England Clean Energy Connect (NECEC) Project
Application for Partial Transfer of MDEP Site Law and NRPA Permits and Water
Quality Certification

Dear Mr. Beyer:

As you know, on May 11, 2020 the Maine Department of Environmental Protection (MDEP) issued to Central Maine Power Company (CMP) Site Location of Development Act (Site Law) and Natural Resources Protection Act (NRPA) permits and a water quality certification for the New England Clean Energy Connect (NECEC) project.

In May 2019 the Maine Public Utilities Commission approved a Stipulation requiring that ownership of NECEC be transferred from CMP to NECEC Transmission LLC (NECEC LLC), including “[A]ll land use permits, any outstanding land use permit applications, and other regulatory permits (the “Permits”) related to the NECEC.” To comply with this requirement, CMP and NECEC LLC hereby submit this application to MDEP for partial transfer of the NECEC Site Law and NRPA permits and water quality certification from CMP to NECEC LLC.

Because the network upgrade components associated with the NECEC will continue to be owned, operated, and maintained by CMP as the interconnecting transmission owner, this transfer application is limited to the following NECEC components that will be owned and operated by NECEC LLC:

- New Section 3006 – 145.1-mile 320kV HVDC line from Merrill Road Converter Station to Canadian border;
- New Section 3007 – 1.2-mile 345kV AC line from Merrill Road Converter to Larrabee Road Substation;
- New Merrill Road HVDC Converter Station in Lewiston;
- New Moxie Gore Termination Station for Kennebec River HDD crossing; and
- New West Forks Termination Station for Kennebec River HDD crossing.

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Attached to this letter are the following completed and signed forms:

1. Site Location Transfer Application.
2. NRPA Permit by Rule Notification Form [Section 17. Transfer/Permit Extension].

Also attached to this letter are the following documents in support of this transfer application.

Attachment A - Updated construction and operational cost estimates.

Attachment B – Evidence of NECEC LLC’s ability to finance the construction and operation of NECEC.

Attachment C – Evidence of NECEC LLC’s technical ability to construct and maintain NECEC, including select team member resumes.

Attachment D – Evidence of NECEC LLC’s title, right or interest (TRI) in NECEC. The attached Transfer Agreement, to be approved by the Maine Public Utilities Commission, includes the granting to NECEC LLC of sufficient property rights to construct and operate the NECEC components that will be owned and operated by NECEC LLC. CMP and NECEC LLC will execute the Transfer Agreement and close on the transfer prior to the beginning of construction of the NECEC.

Attachment E – NECEC LLC Certificate of Good Standing.

Attachment F – Copies of the published Notice of Intent to File and a list of abutters to whom notice was provided.

Attachment G – Affidavit from NECEC LLC attesting that it has received, read, understood and will comply with all terms and conditions of the May 11, 2020 MDEP NECEC permits.

Attachment H – May 11, 2020 MDEP Order approving NECEC.

Attachment I – Attestation that CMP agrees to the partial transfer of the MDEP permits to NECEC LLC.

Attachment J – NECEC Location Map.

A check, payable to “Treasurer, State of Maine”, in the amount of \$417 is being sent to the MDEP via overnight mail. This check covers both the Site Location transfer application fee (\$167) and the NRPA transfer application fee (\$250).

At the time of filing, a copy of this application and its supporting documents are being filed with the clerks of the towns and cities within which the NECEC will be located and, in the case of applicable unorganized areas, with county commissioners.

Thank you for your attention to this transfer application and supporting documentation.

Please call or email Gerry J. Mirabile (cell 207-242-1682; gerry.mirabile@cmpco.com) with any questions.

Sincerely,



Thorn C. Dickinson
President & CEO
NECEC Transmission LLC

Gerry J. Mirabile

Gerry J. Mirabile
Manager – NECEC Permitting
Central Maine Power Company

Attachments

cc: Matt Manahan, Pierce Atwood LLP
Lisa Gilbreath, Pierce Atwood LLP
NECEC DEP and LUPC Service Lists

Site Location Transfer Application

#L- _____
Fees Paid _____
Date Received _____**TRANSFER APPLICATION**

For Site Location and Stormwater Projects

This form shall be used for the transfer of a Site Location permit or a Stormwater permit. All required fees **MUST** be paid when the transfer application is submitted to the Department. Please contact DEP for current fee schedule information. The fee schedule is updated every November 1. The fee is payable to "Treasurer, State of Maine".

Please type or print in black ink only

1. New Applicant Name:		4. Name of Agent:	
2. New Applicant's Mailing Address:		5. Agent's Mailing Address:	
3. New Applicant's Phone # and Fax #:		6. Agent's Phone # and Fax #:	
4. New Applicant e-mail address (REQUIRED):		7. Agent e-mail address (REQUIRED):	
CURRENT PERMIT HOLDER			
8. Current Permittee Name:		10. Current Permittee Contact:	
9. Current Permittee Address:		11. Contact's Telephone Number:	
12. Existing DEP Permit Number:			
LOCATION OF ACTIVITY			
13. Name of Project:			
14. Name of Town where project is located:		15. County:	

All supporting documentation, outlined below, must be attached to this form and sent to the appropriate DEP office in Augusta, Portland or Bangor.

Bureau of Land and Water Quality 17 State House Station Augusta, ME 04333 Tel: (207) 287-3901	Bureau of Land and Water Quality 312 Canco Road Portland, ME 04103 Tel: (207) 822-6300	Bureau of Land and Water Quality 106 Hogan Road Bangor, ME 04401 (207) 941-4570
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REQUIRED INFORMATION

1. Provide a breakdown of costs for any unfinished construction and for project operation. These must include costs resulting from compliance with the Board or Department Order.
2. Provide evidence of the availability and commitment of funds sufficient to complete any unfinished project construction and to operate the project as approved. Submit one of the following three:
 - a. a letter of commitment from a financial institution or funding agency for a specified amount of funds and their use, or
 - b. the most recent corporate annual report and supporting documents indicating sufficient funds to finance the development, or

Site and Stormwater Transfer application**Page 2 04/2008**

- c. copies of bank statements or other evidence indicating availability of the unencumbered funds, when the developer will personally finance the project.
3. Provide a narrative describing the new applicant's technical ability to complete or maintain this development.
4. Provide a complete copy of the deed, lease, purchase option or other documented evidence of the new applicant's title, right or interest in the development.
5. If the new applicant is a registered corporation, provide either a *Certificate of Good Standing* (available from the Secretary of State) or a statement signed by a corporate officer affirming that the corporation is in good standing.
6. Provide evidence of compliance with all public notice requirements (see attached Public Notice Requirements and Certification of Publication).

CERTIFICATIONS / SIGNATURES

Current Permittee Signature. By signing below the current permittee, certifies that he or she agrees to the transfer of the specified permit(s) to the new applicant named on this form.

Signed: <u>Gerry J. Mirabile</u>	Title _____	Date: _____
Print or Type Name: _____		

New Applicant Signature. By signing below the new applicant certifies that he or she is familiar with the DEP project file and will comply with the Board or Department Order being transferred, including all existing minor revisions and amendments to the Order and all attached conditions.

"I certify under penalty of law that I have personally examined the information submitted in this document and all attachments thereto and that, based on my inquiry of those individuals immediately responsible for obtaining the information, I believe the information is true, accurate, and complete. I am aware there are significant penalties for submitting false information, including the possibility of fine and imprisonment.

Further, I hereby authorize the DEP to send me an electronically signed decision on the license I am applying for with this application by e-mailing the decision to the electronic address located on the front page of this application (see #4 and #7)"

"

Signed: <u>Alan C. Diliberto</u>	Title _____	Date: _____
Print or Type Name: _____		

PUBLIC NOTICE FILING AND CERTIFICATION

The DEP Rules, Chapter 2, require an applicant to provide public notice for all Site Location projects with the exception of minor revisions and condition compliance applications. In the notice, the applicant must describe the proposed activity and where it is located. “**Abutter**” for the purposes of the notice provision means any person who owns property that is BOTH (1) adjoining and (2) within one mile of the delineated project boundary, including owners of property directly across a public or private right of way.

1. **Newspaper:** You must publish the Notice of Intent to File in a newspaper circulated in the area where the activity is located. The notice must appear in the newspaper within 30 days prior to the filing of the application with the Department. You may use the attached Notice of Intent to File form, or one containing identical information, for newspaper publication and certified mailing.
2. **Abutting Property Owners:** You must send a copy of the Notice of Intent to File by certified mail to the owners of the property abutting the activity. Their names and addresses can be obtained from the town tax maps or local officials. They must receive notice within 30 days prior to the filing of the application with the Department.
3. **Municipal Office:** You must send a copy of the Notice of Intent to File and a **duplicate of the entire application** to the Municipal Office.

ATTACH a list of the names and addresses of the owners of abutting property.

CERTIFICATION


By signing below, the applicant or authorized agent certifies that:

1. A Notice of Intent to File was published in a newspaper circulated in the area where the project site is located within 30 days prior to filing the application;
2. A certified mailing of the Notice of Intent to File was sent to all abutters within 30 days of the filing of the application;
3. A certified mailing of the Notice of Intent to File, and a duplicate copy of the application was sent to the town office of the municipality in which the project is located; and

The Public Informational Meeting was held on _____.

Date

Approximately _____ members of the public attended the Public Informational Meeting.



Signature of Applicant or authorized agent

Date

**PUBLIC NOTICE:
NOTICE OF INTENT TO FILE**

Please take notice that

(Name, Address and Phone of Applicant)

is intending to file a (check that one that applies):

☐ Site Location of Development Act permit application pursuant to the provisions of 38 M.R.S.A. §§ 481-490 or a

☐ Stormwater Management Law application pursuant to M.R.S.A. § 420-D

with the Maine Department of Environmental Protection on or about _____.
anticipated filing date

The application is for

(description of the project)

at the following location:

(project location)

A request for a public hearing or a request that the Board of Environmental assume jurisdiction over this application must be received by the Department, in writing, no later than 20 days after the application is found by the Department to be complete and is accepted for processing. A public hearing may or may not be held at the discretion of the Commissioner or Board of Environmental Protection. Public comment on the application will be accepted throughout the processing of the application.

For Federally licensed, permitted, or funded activities in the Coastal Zone, review of this application shall also constitute the State's consistency review in accordance with the Maine Coastal Program pursuant to Section 307 of the federal Coastal Zone Management Act, 16 U.S.C. §1456. (Delete if not applicable.)

The application will be filed for public inspection at the Department of Environmental Protection's office in (*Portland, Augusta or Bangor*)(circle one) during normal working hours. A copy of the application may also be seen at the municipal offices in

_____, Maine.
(town)

Written public comments may be sent to the Department of Environmental Protection, Bureau of Land and Water Quality, 17 State House Station, Augusta, Maine 04333-0017.

NRPA Permit by Rule Notification Form
[Section 17. Transfer/Permit Extension]

DEPARTMENT OF ENVIRONMENTAL PROTECTION
PERMIT BY RULE NOTIFICATION FORM

(For use with DEP Regulation, Natural Resources Protection Act - Permit by Rule Standards, Chapter 305)

APPLICANT INFORMATION (Owner)				AGENT INFORMATION (If Applying on Behalf of Owner)			
Name:	NECEC Transmission LLC			Name:	Pierce Atwood		
Mailing Address:	One City Center, 5th floor			Mailing Address:	254 Commercial Street		
Mailing Address:				Mailing Address:			
Town/State/Zip:	Portland, Maine 04101			Town/State/Zip:	Portland, Maine 04101		
Daytime Phone #:	(207) 242-1682	Ext:		Daytime Phone #:	(207) 791-1189	Ext:	
Email Address:	gerry.mirabile@cmpco.com			Email Address:	mmanahan@pierceatwood.com		
PROJECT INFORMATION							
Part of a larger project? (check 1):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	After the Fact? (check 1):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Project involves work below mean low water? (check 1):	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Name of waterbody:	Various
Project Town:	Various		Town Email Address:	Various		Map and Lot Number:	Various
Brief Project Description:	The New England Clean Energy Connect (NECEC) project includes transmission line, converter station and substation components to be located within 25 organized municipalities and 14 unorganized/deorganized townships. This application is for partial transfer of the Natural Resources Protection Act permit [also Site Location] permit #L-27625 from Central Maine Power Company to NECEC Transmission LLC.						
Project Location & Brief Directions to Site:							

PERMIT BY RULE (PBR) SECTIONS (Check at least one): I am filing notice of my intent to carry out work that meets the requirements for Permit-by-Rule (PBR) under DEP Rules, [Chapter 305](#). I and my agent(s), if any, have read and will comply with all of the standards in the Sections checked below.

- | | | |
|---|--|---|
| <input type="checkbox"/> Sec. (2) Act. Adj. to Prot. Natural Res. | <input type="checkbox"/> Sec. (9) Utility Crossing | <input type="checkbox"/> Sec. (16) Coastal Sand Dune Projects |
| <input type="checkbox"/> Sec. (3) Intake Pipes | <input type="checkbox"/> Sec. (10) Stream Crossing | <input checked="" type="checkbox"/> Sec. (17) Transfer/Permit Extension |
| <input type="checkbox"/> Sec. (4) Replacement of Structures | <input type="checkbox"/> Sec. (11) State Transportation Facilities | <input type="checkbox"/> Sec. (18) Maintenance Dredging |
| <input type="checkbox"/> Sec. (6) Movement of Rocks or Veg. | <input type="checkbox"/> Sec. (12) Restoration of Natural Areas | <input type="checkbox"/> Sec. (19) Act. Near SVP Habitat |
| <input type="checkbox"/> Sec. (7) Outfall Pipes | <input type="checkbox"/> Sec. (13) F&W Creat./Water Qual. Improv. | <input type="checkbox"/> Sec. (20) Act. Near Waterfowl/Bird Habitat |
| <input type="checkbox"/> Sec. (8) Shoreline Stabilization | <input type="checkbox"/> Sec. (15) Public Boat Ramps | |

NOTE: Municipal permits also may be required. Contact your local code enforcement office for information. Federal permits may be required for stream crossings and for projects involving wetland fill. Contact the Army Corps of Engineers at the Maine Project Office for information.

NOTIFICATION FORMS CANNOT BE ACCEPTED WITHOUT THE NECESSARY ATTACHMENTS AND FEE

- ☒ **Attach** all required submissions for the PBR Section(s) checked above. The required submissions for each PBR Section are outlined in Chapter 305 and may differ depending on the Section you are submitting under.
- ☒ **Attach** a location map that clearly identifies the site (U.S.G.S. topo map, Maine Atlas & Gazetteer, or similar).
- ☒ **Attach** Proof of Legal Name if applicant is a corporation, LLC, or other legal entity. Provide a copy of Secretary of State's registration information (available at <http://icrs.informe.org/nei-sos-icrs/ICRS?MainPage=x>). Individuals and municipalities are not required to provide any proof of identity.

FEE: Pay by credit card at the [Payment Portal](#). The Permit-by-Rule fee may be found here <https://www.maine.gov/dep/feeschedule.pdf> and is currently \$250.

- ☒ **Attach** payment confirmation from the Payment Portal when filing this notification form.

Signature & Certification:

- I authorize staff of the Departments of Environmental Protection, Inland Fisheries & Wildlife, and Marine Resources to access the project site for the purpose of determining compliance with the rules.
- I understand that this PBR becomes effective 14 calendar days after receipt by the Department of this completed form, the required submissions, and fee, *unless the Department approves or denies the PBR prior to that date.*

By signing this Notification Form, I represent that the project meets all applicability requirements and standards in Chapter 305 rule and that the applicant has sufficient title, right, or interest in the property where the activity takes place.

Signature of Agent or Applicant (may be typed):		Date:	09/25/2020
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Keep a copy as a record of permit. Email this completed form with attachments to DEP at: DEP.PBRNotification@maine.gov. DEP will send a copy to the Town Office as evidence of DEP's receipt of notification. No further authorization will be issued by DEP after receipt of notice. A PBR is valid for two years, except Section 4, "Replacement of Structures," are valid for three years. **Work carried out in violation of the Natural Resources Protection Act or any provision in Chapter 305 is subject to enforcement.**

Attachment A
Updated construction and operational cost estimates

Attachment A**Updated construction and operational cost estimates**

NECEC COSTS	
Capital investment for development and construction	Estimated at \$950 million , which includes compliance with DEP permit conditions required during construction. This investment estimate does not include AFUDC (allowance for funds used during construction).
Operation expenses for years after COD is achieved	Estimated at an annual average of approximately \$40 million / year , which includes post COD DEP permit conditions. This estimate includes all expenses such as operations and maintenance, property taxes, community benefits, general and administration expenses and decommissioning costs.

Attachment B
Evidence of NECEC LLC's ability to finance
construction and operation of NECEC



September 24, 2020

**Re: New England Clean Energy Connect
Application to Transfer Permits – Availability of Funds and Commitment to Fund**

To Whom It May Concern:

This letter is issued in connection with Central Maine Power Company's ("CMP's") and NECEC Transmission LLC's ("NECEC LLC's") application to transfer the Site Location of Development Act (Site Law) and Natural Resources Protection Act (NRPA) permits and water quality certification for certain components of the New England Clean Energy Connect Transmission project (the "NECEC Project") from CMP, to its affiliate NECEC LLC. The permits were approved by an order of the State of Maine Department of Environmental Protection dated May 11, 2020 (the "DEP Order").

Below, please find information about the costs of the NECEC Project and evidence of the availability and commitment of funds sufficient for NECEC LLC to cover the construction and operation costs of the NECEC Project.

NECEC Project costs: As set forth in Attachment A to CMP's and NECEC LLC's transfer application, the NECEC Project capital costs are expected to be \$950 million. Estimated operation expenses are detailed in Attachment A to the transfer application. Such figures include the costs associated with compliance with the DEP Order.

Availability and Commitment of Funds: NECEC LLC is a wholly owned subsidiary of Avangrid Networks, Inc., a Maine corporation ("Avangrid Networks"), and an indirect wholly owned subsidiary of Avangrid, Inc, a New York corporation ("Avangrid"). Avangrid is 81.5% owned by Iberdrola S.A., a leading global investor-owned power and utility company with operations in the United States, Spain, the U.K., Brazil, and Mexico. The remaining 18.5% of Avangrid shares trade on the New York Stock Exchange (NYSE: AGR).

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Avangrid and Avangrid Networks have committed to provide NECEC LLC the funding needed for NECEC LLC to acquire the project from CMP and for construction and operation of the NECEC Project as approved.

Avangrid will make equity contributions of up to \$1,000,000,000 to Avangrid Networks to fund the corresponding equity contributions to be made by Avangrid Networks to NECEC LLC. In turn, Avangrid Networks will make such equity contributions to NECEC LLC.

In addition, Avangrid and NECEC LLC will execute a \$500,000,000 revolving loan agreement, which provides a source of debt financing to NECEC LLC during the construction phase of the NECEC Project. Furthermore, Avangrid will provide parent guarantees, letters of credit, or other such instruments or collateral support required by NECEC LLC counter-parties to support the construction of the NECEC Project.

Avangrid holds credit ratings from S&P (BBB), Moody's (Baa1) and Fitch (BBB+). Avangrid has an equity market valuation of approximately \$15 billion, has assets of approximately \$35 billion, and outstanding long-term debt of approximately \$7.5 billion. To support its short-term financing and liquidity needs, Avangrid has a \$2 billion commercial paper program. Avangrid has revolving credit lines totaling \$3 billion, of which \$2 billion backstops the commercial paper program and \$1 billion is dedicated to providing liquidity to its regulated utilities. Avangrid has issued \$2.1 billion in green bonds since 2017 (exclusive of debt raised by its utility subsidiaries).

NECEC LLC will cover its operation expenses with the revenue from its activities. As part of the transfer of the NECEC Project from CMP to NECEC LLC, CMP will assign to NECEC LLC the seven transmission service agreements dated June 13, 2018, as amended, executed in connection with the NECEC Project (the "TSAs")¹. Under the terms of the TSAs, during the operating phase, in consideration for providing firm transmission service utilizing the NECEC Project, NECEC LLC will receive monthly transmission service payments from the applicable TSAs counterparties.

The financing resources outlined above will be sufficient to complete the approved compensation work, including subsequent monitoring and corrective actions, in accordance with the terms of the DEP Order.

¹ Transmission Service Agreement between Central Maine Power Company and Fitchburg Gas and Electric Light Company d/b/a Unitil; Transmission Service Agreement between Central Maine Power Company and Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid; Transmission Service Agreement between Central Maine Power Company and Nstar Electric Company d/b/a Eversource Energy; Transmission Service Agreement (Unitil – 12.317 MW) between Central Maine Power Company and H.Q. Energy Services (U.S.) Inc.; Transmission Service Agreement (National Grid – 498.348 MW) between Central Maine Power Company and H.Q. Energy Services (U.S.) Inc.; Transmission Service Agreement (Eversource Energy – 579.335 MW) between Central Maine Power Company and H.Q. Energy Services (U.S.) Inc.; and Additional Transmission Service Agreement between Central Maine Power Company and H.Q. Energy Services (U.S.) Inc.


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We hope this information meets your needs. Please call me at (207) 629-1280 if you have any questions concerning this letter.

Sincerely,

DocuSigned by:

55F3969FAADA48C...

Howard Coon
Vice-President & Treasurer
Avangrid

On behalf of Avangrid, Inc. and Avangrid Networks, Inc.

AVANGRID / One City Center, 5th floor, Portland, ME, 04101



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Attachment C
Evidence of NECEC LLC's Technical Ability



New England Clean Energy Connect **Application to Transfer Permits**

Technical Ability

Reference is made to Central Maine Power Company's ("CMP") and NECEC Transmission LLC's ("NECEC LLC") application to transfer the Site Law and Natural Resource Protection Act permits and water quality certification for certain components of the New England Clean Energy Connect Transmission Project (the "NECEC Project") from CMP, to its affiliate NECEC LLC. These permits (permits L-27625) were approved by an Order of the State of Maine Department of Environmental Protection dated May 11, 2020 (the "DEP Order").

This document addresses NECEC LLC's technical ability to complete and maintain the NECEC Project.

1. INTRODUCTION

NECEC LLC is a wholly owned subsidiary of Avangrid Networks, Inc., a Maine corporation ("Avangrid Networks"), and an indirect wholly owned subsidiary of Avangrid, Inc, a New York corporation (NYSE: AGR) ("Avangrid").

Avangrid is a leading sustainable energy company with approximately \$34 billion in assets and operations in 24 states. Avangrid has two primary lines of business - Avangrid Networks and Avangrid Renewables. Avangrid Networks owns eight electric and natural gas utilities, serving approximately 3.3 million customers in New York and New England. Avangrid Renewables owns and operates 8.0 gigawatts of electricity capacity, primarily through wind power, with a presence in 22 states across the United States.

Iberdrola S.A., a corporation organized under the laws of the Kingdom of Spain, a worldwide leader in the energy industry, directly owns 81.5% of outstanding shares of Avangrid common stock. The remaining outstanding shares of Avangrid are publicly traded on the New York Stock Exchange and owned by various shareholders.

Avangrid Networks' electric operating subsidiaries include: Central Maine Power Company ("CMP"), Maine Electric Power Company, Inc. ("MEPCO"), New York State Electric & Gas Corporation ("NYSEG"), Rochester Gas and Electric Corporation ("RG&E"), and The United Illuminating Company ("UI"). Avangrid Networks' operating subsidiaries have an extensive history of electric transmission and delivery that dates back more than 150 years, and they are transmission owners in the ISO-New England Inc. ("ISO-NE") and New York Independent System Operator Inc. ("NYISO") control areas, operating approximately 8,500 miles of electric transmission lines, 71,000 miles of electric distribution lines, and 904 substations.



The Avangrid family of companies utilizes a shared services model, which allows transmission and distribution utilities to receive shared services as part of an integrated energy holding company. Avangrid Service Company (“ASC”), a Delaware limited liability company that is a subsidiary of Avangrid Networks, is the primary service company for Avangrid Networks’ subsidiaries.

To facilitate the development, construction, operation and maintenance of the NECEC Project, on or before the transfer of the NECEC Project to NECEC LLC, NECEC LLC will execute service agreements with CMP and ASC, whereby CMP and ASC will provide corporate and technical services to NECEC LLC in connection with the NECEC Project. NECEC LLC will rely on the services of these affiliates for the development, construction, operation and maintenance of the NECEC Project. The service agreement to be executed by CMP and NECEC LLC (“CMP-NECEC LLC Service Agreement”) is attached hereto as Exhibit A. Similarly, the service agreement to be executed by ASC and NECEC LLC (“ASC-NECEC LLC Service Agreement”) is attached hereto as Exhibit B. NECEC LLC may also, from time to time, receive technical services from other Avangrid Networks’ operating subsidiaries such as NYSEG, RG&E and UI.

Examples of recent transmission projects completed by CMP and other Avangrid Networks’ operating subsidiaries are included in Exhibit C.

2. HVDC TRANSMISSION SYSTEMS

Iberdrola S.A., the controlling shareholder of Avangrid, has developed, managed, designed, and executed a large HVDC Project in the United Kingdom. Additionally, Iberdrola S.A. has participated in HVDC research and development initiatives in Mexico and the United States.

3. OTHER TRANSMISSION SYSTEMS AND SUBSTATIONS

Avangrid Networks’ operating subsidiaries operate and maintain transmission lines and substations across the New England region and New York State.

- CMP serves approximately 624,378 electricity customers (557,502 residential and 66,876 non-residential) in 346 communities within an 11,000 square-mile service area in central and southern Maine. CMP currently operates and maintains over 2,911 miles of transmission lines and 254 substations, 63 of which are administered by ISO-NE.
- RG&E serves 378,461 electricity customers (337,036 residential and 41,585 non-residential) in 9 counties, 28 cities and villages, and 58 towns in New York. RG&E owns and maintains 1,094 miles of transmission lines, 8,808 miles of distribution lines and 154 substations.
- NYSEG serves 893,782 electricity customers (771,527 residential and 122,255 non-residential) in 33 counties, 92 cities and villages, and 169 towns in New York. NYSEG owns and maintains 4,513 miles of transmission lines, 35,081 miles of distribution lines and 430 substations.



- UI serves approximately 337,000 residential, commercial and industrial customers in the greater New Haven and Bridgeport areas of Connecticut. UI's service territory includes 17 Connecticut towns and cities in an area totaling 335 square miles along or near the shoreline of Long Island Sound. UI has 28 bulk 13.8 kV substations and 4 switching stations, 3,282 pole-line miles of overhead distribution lines and 691 miles of underground primary cables.

4. OPERATION AND MAINTENANCE

NECEC LLC will be responsible for the operation and maintenance (“O&M”) of all transmission lines and other facilities associated with the NECEC Project, except for any upgrades to existing transmission systems required for the interconnection of the NECEC Project to the New England transmission system, which will be operated and maintained by the affected transmission owner, including CMP.

O&M of the NECEC Project will mostly be performed by CMP, on behalf of NECEC LLC, pursuant to the CMP-NECEC LLC Service Agreement.

In the case of the less mature technologies proposed in the NECEC Project (HVDC transmission line and HVDC Converter) NECEC LLC and CMP will work with the equipment vendors and will follow the recommended maintenance practices for the equipment. CMP will use its own employees to perform the services under the CMP-NECEC LLC Service Agreement in connection with this equipment, initially under the direction of the vendor’s experts to obtain any additional training that may be required, and eventually completely on its own. NECEC LLC will have ongoing contracts with the vendors to support emergent O&M requests. Planned maintenance of the NECEC transmission and substation facilities will be conducted and scheduled pursuant to the applicable ISO-NE requirements and best utility practices and generally will be performed without any planned long-term transmission/electrical outages.

5. KEY PERSONNEL

The Avangrid Networks’ companies have significant experience in the development, construction, and operation of electric infrastructure projects. Staff at ASC and CMP will provide services to NECEC LLC related to the development, construction and operation of the NECEC Project. Resumes of key personnel that will be working on the NECEC Project are provided as **Exhibit D**.

In addition, NECEC LLC will have the support and rely on the services of a team of highly qualified and experienced contractors. A brief qualifications summary is provided below for each of these companies.

Black & Veatch Corporation: An employee-owned, global engineering, procurement, construction and consulting company specializing in infrastructure development in power, oil and gas:

- ranked 12th in ENR’s Top 500 design firms and top design build firms
- ranked 15th in ENR’s Top 100 construction management-for-fee firms

TRC: Provides environmentally advanced and technology powered solutions for the power, oil and gas and infrastructure industries.



Realtime Utility Engineers: A subsidiary of Quanta Services, Realtime has the expertise to provide electrical/civil/structural engineering, material specifications and procurement, to construction and commissioning.

Hitachi ABB Power Grids: A world-leader in power technologies, including high-voltage direct current (HVDC) systems, and is the partner of choice for enabling stronger, smarter and greener grids.

Burns & McDonnell: The technology and security solutions consultancy provides a full range of services that support utilities in strategic planning, analysis, design and construction of complex electrical distribution system infrastructure.

Cianbro/Irby: Presently operating in more than 40 states and employing over 4,000 team members, Cianbro manages and self-performs civil, structural, mechanical, electrical, instrumentation, telecommunications, thermal, fabrication, and coating. With formation of a joint venture for this project, Irby Construction Company builds power infrastructure on a turnkey basis. As a premier transmission construction company, Irby constructs high-voltage power line projects that span the entire United States— from the pacific coast to the eastern seaboard. Irby also constructs and connects substations and distribution systems.

Sargent Electric Company: Sargent Electric Company has a long history with more than 100 years of experience. Established in 1907 to serve the steel, glass and coal industries in Pittsburgh, Pennsylvania, Sargent Electric Company has since evolved into one of the largest electrical contracting companies in the area, providing comprehensive services to its clients.

Northern Clearing Inc.: Northern Clearing Inc. is the industry leader in right of way clearing, restoration, access road construction, vegetation management, conservation, and mat services. Since 1966, Northern Clearing has provided its customers with a superior level of safety, compliance, and production.



Exhibit A

CMP-NECEC LLC Service Agreement

**SERVICE AGREEMENT BETWEEN
CENTRAL MAINE POWER COMPANY
AND
NECEC TRANSMISSION LLC**

This Service Agreement (this “Agreement”) is made and entered into this _____ day of _____, _____ by and between Central Maine Power Company (“**Provider Company**”) and NECEC Transmission LLC (“**Client Company**”), respectively identified on the signature page herein. Provider Company and Client Company may be referred herein individually as a “**Party**” and collectively as “**Parties**”.

WITNESSETH

WHEREAS, the Provider Company and the Client Company are wholly owned subsidiary companies of Avangrid, Inc. (“**Avangrid**”).

WHEREAS, Avangrid is integrated into the group of companies controlled by Iberdrola, S.A. (“**IBE**”) and, as a result, is a “controlled company” within the meaning of the New York Stock Exchange (“**NYSE**”) rules. IBE is the controlling shareholder of Avangrid and its subsidiaries (collectively, the “**Avangrid Group**”) and the relationship between IBE and the Avangrid Group is subject to U.S. laws, regulations, rules and standards applicable to U.S. publicly traded companies (e.g. Securities and Exchange Commission (“**SEC**”) regulations, requirements pursuant to the Sarbanes-Oxley Act, NYSE listing standards, etc.). Consistent with IBE’s Corporate Governance System, Avangrid operates under a framework of strengthened autonomy due to its status as a publicly listed company;

WHEREAS, Avangrid initially received authorization for intercompany service agreements from the SEC in accordance with the requirements of Section 13(b) of the Public Utility Holding Company Act of 1935 (“**35 Act**”);

WHEREAS, the Energy Policy Act of 2005 (“**EPAct 2005**”) repealed the 35 Act and the intercompany services agreements are now in accordance with applicable provisions of EPAct 2005, including but not limited to the Public Utility Holding Company Act of 2005 and the regulations of the Federal Energy Regulatory Commission (“**FERC**”); and

WHEREAS, Provider Company and Client Company have entered into this Agreement whereby Provider Company agrees to provide and Client Company agrees to accept and pay for various services as provided herein at cost, with cost determined in accordance with applicable rules and regulations, which require Provider Company to fairly and equitably allocate costs among all affiliate companies to which it renders services (collectively, the “**Client Companies**”), including Client Company.

NOW THEREFORE, in consideration of the premises and the mutual agreements herein contained, the Parties to this Agreement agree as follows:

ARTICLE I - SERVICES

Section 1.1 Provider Company shall furnish to Client Company, as requested by Client Company, upon the terms and conditions hereinafter set forth, such of the services described in Appendix A hereto, at such times, for such periods and in such manner as Client Company may from time to time request and that Provider Company concludes it is able to perform. Provider Company shall also provide Client Company with special services, so long as such services do not materially add to those services described in Appendix A hereto, as may be requested by Client Company and that Provider Company concludes it is able to perform. In supplying such services, Provider Company may arrange, where it deems appropriate, for the services of such experts, consultants, advisers, and other persons with necessary qualifications as are required for or pertinent to the provision of such services.

Section 1.2 Client Company shall take from Provider Company such of the services described in Appendix A, and such additional special services, as limited by Section 1.1 hereof, as are requested from time to time by Client Company and that Provider Company concludes it is able to perform.

Section 1.3 The cost of the services described herein or contemplated to be performed hereunder shall be directly assigned, distributed or allocated by activity, project, program, internal order or other appropriate basis. Client Company shall have the right from time to time to amend or alter any activity, project, program or internal order provided that (i) any such amendment or alteration that results in a material change in the scope of the services to be performed or equipment to be provided is agreed to by Provider Company, (ii) the cost for the services covered by the activity, project, program or internal order shall include any expense incurred by Provider Company as a direct result of such amendment or alteration of the activity, project, program or internal order, and (iii) no amendment or alteration of an activity, project, program or internal order shall release Client Company from liability for all costs already incurred by or contracted for by Provider Company pursuant to the activity, project, program or internal order, regardless of whether the services associated with such costs have been completed.

Section 1.4 Provider Company shall use its best efforts to maintain a staff trained and experienced in the services described in Appendix A.

ARTICLE II - COMPENSATION

Section 2.1 As compensation for the services to be rendered hereunder, Client Company shall pay to Provider Company all costs that reasonably can be identified and related to particular services performed by Provider Company for or on its behalf. The methods for

assigning or allocating Provider Company costs to Client Company, as well as to other affiliate companies, are set forth in Appendix A.

Section 2.2 It is the intent of this Agreement that charges for services shall be distributed among Client Companies, to the extent possible, based upon direct assignment. The amounts remaining after direct assignment shall be allocated among the Client Companies using the methods identified in Appendix A. The method of assignment or allocation of cost shall be subject to review by the Provider Company annually, or more frequently if appropriate. Such method of assignment or allocation of costs may be modified or changed by the Provider Company without the necessity of an amendment to this Agreement; provided that, in each instance, all services rendered hereunder shall be at actual cost thereof, fairly and equitably assigned or allocated, all in accordance with the requirements of the EAct 2005 and any orders promulgated thereunder. The Provider Company shall review with the Client Company any proposed material change in the method of assignment or allocation of costs hereunder and the Parties must agree to any such changes before they are implemented.

Section 2.3 Provider Company shall render a monthly report to Client Company that shall reflect the information necessary to identify the costs charged for that month in accordance with the Uniform System of Accounts for Mutual and Subsidiary Service Companies. Client Company shall remit to Provider Company all charges billed to it within 30 days of receipt of the monthly report. Any amounts not paid by the due date will be subject to a late charge of .5 % per month until the remittance is received.

Section 2.4 It is the intent of this Agreement that the payment for services rendered by Provider Company to Client Company under this Agreement shall cover all the costs of its doing business, to the extent related to the provision of the services, including, but not limited to, salaries and wages, office supplies and expenses, outside services employed, property insurance, injuries and damages, employee pensions and benefits, miscellaneous general expenses, rents, maintenance of structures and equipment, depreciation and amortization, and compensation for use of capital as permitted by applicable laws and regulations.

Section 2.5 Provider Company and Client Company acknowledge that the regulatory commission of the appropriate jurisdiction has the right to review the amount of compensation to be paid by Client Company hereunder.

ARTICLE III - TERM

This Agreement shall become effective as of the date first written above, subject only to the receipt of any required regulatory approvals from any State regulatory commission with jurisdiction over Client Company and shall continue in force until terminated by Provider Company or Client Company, upon not less than 90 days prior written notice to the other Party. This Agreement shall also be subject to termination or modification at any time, without notice, if and to the extent performance under this Agreement may conflict with the EAct 2005 or with

any rule, regulation or order of the FERC or any State regulatory commission with jurisdiction over Client Company adopted before or after the date of this Agreement.

ARTICLE IV - MISCELLANEOUS

Section 4.1 Accounting.- All accounts and records of Provider Company shall be kept in accordance with applicable rules and regulations promulgated by the FERC, in particular, the Uniform System of Accounts for Centralized Service Companies in effect as of or after the date hereof.

Section 4.2 Access to accounts and records.- Provider Company shall permit Client Company access to its accounts and records including the basis and computation of assignments and allocations.

Section 4.3 Confidentiality.- All the information received by each Party from the other under this Agreement and provided in connection with the services, shall be confidential in nature and may not be used for purposes other than those contemplated in this Agreement, unless otherwise agreed upon by the Parties.

The Parties undertake, in relation to the above information, to safeguard it diligently and not to disclose it to any third party without the consent of the other Party, other than to consultants, contractors, advisors or other service providers (“**Advisors**”) in conjunction with the provision or performance of the services. In any such case, the Party disclosing the information to such Advisors shall ensure that such Advisors assume the confidentiality undertaking provided for herein.

Notwithstanding anything to the contrary in this Agreement, the Parties may use and disclose such information when required to do so in litigation, administrative, regulatory or other legal proceedings or as otherwise required by applicable law or to the extent required to do so by a governmental authority with jurisdiction over the disclosing Party; provided that the disclosing Party must first provide notice to the other Party and afford the non-disclosing Party an opportunity to seek a protective order or other relief to prevent or limit disclosure of such information.

In connection therewith, when, as a result of the performance of the services, Provider Company gains access to commercially sensitive information from Client Company, Provider Company, in accordance with applicable law, shall adopt the necessary measures to maintain the confidentiality of such information.

The provisions of this clause shall apply while the Agreement remains in force and for a period of two years after its termination, other than when the confidential information becomes publically known for reasons other than a breach by a Party of its obligations hereunder.

Section 4.4 Transparency.- Provider Company and Client Company shall inform the regulators of the transactions performed among them under this Agreement, if requested and/or required by applicable law.

Section 4.5 Notices.- All notifications among the Parties in connection with this Agreement shall be made in writing and delivered by hand with written acknowledgement of receipt by the other Party or by fax, post or e-mail, as well as any other means, provided that a record is at all times made of receipt by the addressee.

Section 4.6 Severability.- Should any court or competent authority declare null and void any of the provisions of this Agreement, the whole document shall remain in force, other than such null and void provision(s).

Section 4.7 Modification.- The terms of this Agreement may only be amended by written agreement between the Parties.

Section 4.8 Assignment.- All of the rights under this Agreement are exclusive to the Parties and may not be assigned without the prior written consent of the Parties.

Section 4.9 Taxes.- Each Party shall, at its own expenses, pay all applicable taxes, based on applicable law. Each Party also shall provide to the other, in a timely manner, any documents and information that may be requested that may assist in the preparation of any tax filing or planning.

Section 4.10 Dispute Resolution.- In the event that any conflict or dispute arises among any of the Parties in connection with this Agreement, the Parties shall enter into negotiations in order to try to resolve it by mutual agreement within 30 days, or any other period as may be agreed between the Parties.

Section 4.11 Applicable law.- This Agreement shall be governed by the laws of the State of Maine.

Section 4.12 Ethics.- Each Party shall conduct itself in accordance with the highest ethical standards and principles.

Section 4.13 Entire Agreement.- This Agreement includes all of the agreements, terms, and conditions agreed on by the Parties regarding its subject matter, and supersedes any other prior agreement or conversation between the Parties in relation to such subject matter.

This Agreement may be executed (such execution to be evidenced by either signature or electronic consent consistent with federal and state law on electronic signature) in any number of counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed as of the date and year first above written.

CENTRAL MAINE POWER COMPANY

By: _____

Name:

Title:

By: _____

Name:

Title:

NECEC TRANSMISSION LLC

By: _____

Name:

Title:

By: _____

Name:

Title:

APPENDIX A**Description of Services to be Provided by Provider Company and Determination of Charges for Such Services to the Client Companies**

This document sets forth the description of services that can be provided by Avangrid Group affiliate companies (“Provider Company”) and the methodologies used to determine the cost, assignment, and allocation of services provided and to assign or allocate such costs to Avangrid Group affiliate companies (“Client Company”) within the Avangrid Group.

Description of Services

A description of each of the services performed by Provider Company, which may be modified from time to time, is presented below.

1. Accounting Services such as establishing accounting policies, the maintenance of books and records, corporate financial consolidation, preparation of financial reports, annual capital and operating plan preparation (on a per company and corporate basis), fixed asset accounting, and compliance with applicable laws and regulations.
2. Audit Services include the management of an entity-wide framework of corporate controls.
3. Corporate Planning Services include the preparation of corporate plans, budgets and financial forecasts, monitoring trends and evaluating business opportunities.
4. Executive Services include general and administrative management and strategic planning.
5. Finance and Treasury Services include the coordination of activities relating to securities issuances, monitoring capital markets, cash management, bank reconciliation and administering insurance programs, and tax services for the coordination of income, property and revenue tax compliance and tax accounting.
6. Governmental Affairs Services include monitoring, reviewing and researching legislation and lobbying government officials.
7. Accounts Payable Services include the accurate and timely payment of invoices and employee expense reports, allocation of expenses to the proper general ledger accounts, production of annual reports to the IRS, maintenance of vendor information and source documents, processing checks and wire transfers, and performing bank reconciliations.

8. Human Resources Services include the establishment and administration of employee policies, the supervision of compliance with legal requirements in the areas of employment, compensation, benefits and employee health, welfare, and safety and contract negotiation and relations management with labor unions; and employee performance management program. May also maintain the employee master files relating to each employee as well as manage recruiting, training, and promotions.
9. Corporate Security Services include the establishment of a security program and entity-wide governance framework to manage, oversee and assist the organization in meeting its corporate, legal, and regulatory responsibilities with regard to the protection of cyber, physical and information assets.
10. Payroll Services include the supervision and coordination of the calculations, records and control requirements necessary to generate payment of employee salaries and wages and to maintain relevant employee information.
11. Records Retention Services include coordinating and maintaining a program for ensuring safe on- and off-site records retention in accordance with applicable regulations.
12. Regulatory Management Services include coordination of the Client Companies' rates and regulatory economics departments including rate-related compliance matters.
13. Legal Services include the coordination and direction of law and regulatory departments, legal support for all of the Client Companies, including managing litigation, contract review and negotiations and participating in state and federal regulatory proceedings.
14. Other Corporate Support Services may include corporate communications services, transportation, logistical and administrative support.
15. Transmission and Supply Services include activities related to the coordination and direction of electric and/or gas transmission, storage, and supply functions.
16. Distribution Services include activities related to the coordination and direction of electric and/or gas distribution functions.
17. Information Technology Services include centralized information technology services for the Client Companies such as Data Center Operations, IS Networking and Telecommunications systems operations and maintenance, software applications development and maintenance, technology development, end user support, and printing and mailing of utility customer bills.

18. Supply Chain Services include centralized purchasing services such as procurement of materials and supplies, fleet services, contract administration and materials management for the Client Companies.
19. Customer Services include call center operations including responding to Client Companies' customer calls, customer billing, accounts receivable, credit and collections services, customer satisfaction monitoring and management of low income programs.
20. Engineering Services include centralized customary engineering services including design engineering, general engineering, construction engineering and GIS technology development, meter services and testing and operations.
21. Commodity Planning Service includes coordination and direction of gas or electric supply planning and procurement at utility or non-utility companies.

Provider Company accounting, billing and cost allocation methods utilize the “Uniform System of Accounts for Mutual Service Companies and Subsidiary Service Companies” and are structured so as to comply with the FERC standards for service companies in registered holding-company systems.

Cost Assignment

Provider Company maintains an accounting system that enables costs to be identified by Internal Order (I/O) number. These I/O numbers will indicate whether the cost is a direct charge or the result of an allocated charge. The primary inputs to the accounting system are time reports, accounts payable invoices and journal entries. Charges for labor are calculated using the employees' hourly rate. All Provider Company employees will maintain a record of their time. Employees will utilize separate I/O to record their activities, including the services provided directly to Client Companies. All employees will charge their time on a daily basis using designated increments. The time sheets will be reviewed and approved by department supervisors. The wages of those employees, such as administrative assistants and secretaries, who generally assist employees who provide services directly to system companies, will be allocated based on the allocation of the wages of the employees they assist. Time records will be maintained for three years. Indirect attributable costs are charged to the services performed in proportion to the directly assigned costs or other appropriate cost allocations.

Costs will be accumulated by I/O number and assigned as follows:

1. Costs accumulated in an I/O number for services specifically performed for a single Client Company will be directly assigned or billed to that Client Company.

2. Costs accumulated in an I/O number for services specifically performed for two or more Client Companies will be distributed among those Client Companies using methods determined on a case-by-case basis consistent with the nature of the work performed and on one of the allocation methods described below.
3. Costs accumulated in an I/O number for services of a general nature, which are applicable to all Client Companies, will be allocated among all Client Companies, including the holding company, and billed to them using the global allocation factor.

Cost Allocation

Provider Company uses cost allocation methods designed to fully distribute costs. Provider Company's cost allocation methodology is comprised of the following three steps:

1. To “direct charge” all labor, materials and other expenses to Client Companies whenever feasible.
2. To allocate directly attributable costs to Client Companies based upon a measurable cost causing relationship, i.e., payroll department costs are allocated on the number of employees for each Client Company.
3. To allocate indirectly attributable costs that are common to all Client Companies, including the holding company, using the global allocation factor taking into consideration the relative size of each Client Company with regards to gross revenues, gross payroll expense and plant.

Costs that can be directly attributed to direct charges are allocated in proportion to the direct charges or other appropriate cost allocations. For example, direct labor charged to prepare testimony for a specific utility not only includes the direct payroll charge (the hourly rate times the hours reported) but also includes the cost of that individual's proportional payroll overhead cost, and such other overheads as common asset usage, occupancy charges and management overhead charges (commonly referred in aggregate as an Administrative and General Overhead).

Provider Company will independently charge Client Company for the use of office space used exclusively by employees of Provider Company that provide services to Client Company. The charge for the use of office space will be determined based on a cost allocation.

General and administrative costs that are not associated with a specific, identifiable, causal relationship are pooled and allocated to all system companies, including the holding company.

Allocation Methods

Allocations related to Direct Labor Charges

The following allocations will be applied to the Direct Labor Charges:

Payroll Overhead Charge will be calculated to recover costs associated with labor, such as pension, benefits, lost time and payroll taxes. The payroll overhead costs will be charged to Client Companies based on direct labor charges. The rate is computed by dividing the annual payroll overhead expenses by the annual base labor dollars.

Other Allocations applied to Direct Labor Charges will consist of the following:

1. Common Asset Usage Overhead:

The Common Asset Usage Overhead allocates the cost of furniture and desktop equipment (including PC's) used by Provider Company. The rate is calculated by dividing the economic carrying costs of the assets by the total actual labor dollars of employees using those assets. This overhead is directly applied to all Provider Company labor charged or allocated to Client Companies.

2. Occupancy Overhead:

The Occupancy Overhead allocates costs related to the workspace occupied by Provider Company employees. The rate is calculated by dividing the economic carrying costs for the buildings by the total actual labor dollars of employees working in those buildings. This overhead is directly applied to all Provider Company labor charged or allocated to Client Companies.

3. Management Overhead:

This overhead represents the management cost of a function within Provider Company. It is based on the ratio of Provider Company supervisory wages to all other wages. This fixed rate is applied to all direct labor charged to Client Companies.

An Alternative Allocation Applied to Direct Labor Charges or Other Direct Charges

An alternative allocation applied to direct labor charges or other direct charges is commonly referred to as an Administrative and General Support Adder. This overhead is a general overhead used in place of other specific administrative and general support overheads and is added to total costs of client services. The purpose is to recover indirect administrative and general expenses incurred and not otherwise charged directly to Client Companies for certain activities. The adder also includes expenses associated with office facilities, including furniture and office equipment, used in performing these administrative functions.

Allocations related to Distributed Services

The following ratios will be used to allocate costs for services not directly assigned but pooled and allocated based on a causal measurement:

Number of Employees Ratio - Based on the number of employees benefiting from the performance of a service. This ratio will be determined annually based on actual count of applicable employees at the end of the previous calendar year and may be adjusted periodically due to a significant change.

Accounts Payable Ratio - Based on the number of invoices processed for each of the specific Client Companies. This ratio is determined annually based on the actual count of invoices at the end of the previous calendar year and may be adjusted periodically due to a significant change.

Number of Customers Ratio - Based on the number of customers at each Client Company benefiting from the performance of a service. This ratio will be determined annually based on the average annual customer count and may be adjusted periodically due to a significant change.

Global Allocation Factor - This formula will be determined annually based on the average of gross plant (original plant in service), gross payroll charges (salaries and wages, including overtime, shift premium and lost time, but excluding pension, payroll taxes and other employee benefits) and gross revenues during the previous calendar year and may be adjusted for any known and reasonable quantifiable events or at such time as may be required due to significant changes. This formula is commonly referred to as the Massachusetts Formula.

Regulated Global - 5 Allocation Factor - This formula is derived through utilization of the same data as the Regulated Global allocation factor above, but it is limited to data of the following six utility subsidiaries: NYSEG, CMP, MNG, MEPCO and RGE.

Regulated Global - 3 Allocation Factor - This formula is derived through utilization of the same data as the Regulated Global - 5 allocation factor above, but it is limited to data of the following three utility subsidiaries: NYSEG, CMP, and RGE.

Commodity Energy Supply Transaction System Allocation Factor - This formula is used to allocate the cost of management of the Energy Supply Transaction System to all Client Companies that benefit from this system. The formula is derived through utilization of the gas and/or electric supply costs of the Client Companies and reflects the proportion of such costs occurring between these entities.

Commodity - Global Allocation Factor - This formula is used to allocate the cost of commodity planning, procurement, and sale when the service is applicable to or benefits all Client Companies, regardless of whether they are a gas, electric, or combined company. The formula is derived through utilization of the gas and/or electric supply costs of the Client Companies and reflects the proportion of such costs occurring between these entities.

Commodity - Regulated Gas Allocation Factor - This formula is used to allocate costs for gas commodity planning, procurement and sale for regulated gas utility Client Companies. The

formula is derived through utilization of the gas supply costs of the regulated gas utility affiliates and reflects the proportion of such costs occurring between these entities.

Electric Allocation Factor - This formula is used to allocate costs for the coordination and direction of electric transmission issues for the benefit of regulated electric utility Client Companies and departments. The formula is derived through utilization of the same data as the global allocation noted above, but it is limited to data of electric operating companies or departments.



Exhibit B

ASC-NECEC LLC Service Agreement



SERVICE AGREEMENT
between Service Company and Client Company

This Service Agreement (this "Agreement") is made and entered into as of this _____ by and between the signing companies. The undersigned service provider signatory company ("Service Company") may provide services to the undersigned receiving signatory company ("Client Company") as further detailed in Corporate Services Appendix A attached hereto and at the cost estimated on Appendix B attached hereto, calculated on the basis of the Cost Allocation Manual attached as Appendix C. Service Company and Client Company may be referred to herein individually as "Party" and collectively as "Parties."

RECITALS

WHEREAS, Service Company and Client Company are part of the Avangrid Group of companies;

WHEREAS, AVANGRID, Inc. ("AGR") is integrated into the group of companies controlled by Iberdrola, S.A. ("IBE") and, as a result, is a "controlled company" within the meaning of the New York Stock Exchange ("NYSE") rules. IBE is the controlling shareholder of AGR and its subsidiaries (collectively, the "AGR Group") and the relationship between IBE and the AGR Group is subject to U.S. laws, regulations, rules, and standards applicable to U.S. publicly traded companies (e.g., Securities and Exchange Commission ("SEC") regulations, requirements pursuant to the Sarbanes-Oxley Act, , NYSE listing standards, etc.). Consistent with IBE's Corporate Governance System, AGR operates under a framework of strengthened autonomy due to its status as a publicly-listed company;

WHEREAS, AGR initially received authorization for intercompany service agreements from the SEC in accordance with the requirements of Section 13(b) of the Public Utility Holding Company Act of 1935 ("35 Act");

WHEREAS, the Energy Policy Act of 2005 ("EPAct 2005") repealed the 35 Act and the intercompany service agreements are now in accordance with applicable provisions of EPAct 2005, including but not limited to the Public Utility Holding Company Act of 2005 and the regulations of the Federal Energy Regulatory Commission ("FERC"); and

WHEREAS, Service Company and Client Company have entered into this Agreement whereby Service Company agrees to provide and Client Company agrees to accept and pay for various services as provided herein at cost, with cost determined in accordance with applicable rules and regulations, which require Service Company to fairly and equitably allocate costs among all affiliate companies to which it renders services (collectively, the "Client Companies"), including Client Company.

NOW THEREFORE, in consideration of the premises and the mutual agreements herein contained, the Parties to this Agreement agree as follows:

CLAUSES

1.- SCOPE OF THE AGREEMENT

1.1.- Subject Matter of the Agreement

The purpose of this Agreement is to govern the relationship between Service Company and Client Company with respect to the services detailed in Appendix A (hereinafter, the “Services”) that Service Company may provide at the request of Client Company based on the terms and conditions established in this Agreement.

Appendix B includes the estimated cost of Services for the _____ financial year. This cost may be reviewed for each consecutive year.

To the extent the Client Companies have determined that they require additional services to those described in Appendix A, the Parties shall execute an amendment in order to identify the proper scope of the new services to be provided.

1.2.- Termination of previous agreements

The Parties expressly represent that, by entering into this Agreement, any such framework agreements for identical contracted services between the Parties as may have been executed beforehand, are terminated by operation of law and rendered without any effect whatsoever.

2.- TERM OF THE AGREEMENT

This Agreement shall remain in force as long as the Service Company and Client Company continue forming part of the Avangrid Group.

As soon as a Client Company ceases to form part of the Avangrid Group, in line with the provisions of the preceding paragraph, the contractual relationship under this Agreement between Service Company and the company ceasing to form part of the Avangrid Group shall be automatically terminated as from the date on which such company effectively ceases to form part of the Avangrid Group.

Notwithstanding the foregoing, this Agreement may be terminated at any time by mutual agreement between the Parties or on any other grounds provided by applicable law.

If and to the extent performance under this Agreement may conflict with the EPAct 2005 or with any rule, regulation or order of the FERC or any regulatory commission with jurisdiction over Client Company adopted before or after the date of this Agreement, then the Parties may either terminate this Agreement pursuant to this Clause or modify this Agreement pursuant to Clause 8.1.

3.- PROVISION OF THE SERVICES TO THE CLIENT COMPANIES

3.1.- Services of Service Company

Service Company shall provide to Client Company, on a one-time or recurring basis, the Services identified in Appendix A so requested by Client Company, pursuant to the Cost Allocation Manual in Appendix C.

Service Company shall not, within the context of a provision of Services, receive preferential treatment due to its status as an affiliate company, consistent with the terms of Appendix C.

The Services requested by the Client Company shall be provided by Service Company.

In order to ensure the best results of the contracted Services, the Client Company is responsible for the provision of precise, accurate and complete information and instructions to Service Company. The Client Company assumes any liability and responsibility for any damages or losses resulting from such information or instructions provided to Service Company for the contracted Services. Service Company's liability is limited to non-performance, fraud, negligence or intentional misconduct.

3.2.- Quality of the Services

Service Company shall, when performing the contracted Services, use all of the expertise, care and diligence as may be expected of a company engaged in the provision of such Services, and the Parties may by mutual agreement establish specific quality standards for some of the Services, formalized, as the case may be, under a written document to be attached to this Agreement as a schedule hereto. Service Company will provide the contracted Services consistent this Agreement and Service Company's specific internal rules and procedures.

3.3.- Price and invoicing

3.3.1.- Price

All Services rendered hereunder shall be at cost thereof, and shall be assigned or allocated consistent with the Cost Allocation Manual in Appendix C, and in accordance with applicable law. Service Company shall review with Client Company any proposed material change in the method of assignment or allocation of costs hereunder and the Parties must agree to any such changes before they are implemented. The price of the Services will be calculated annually, based on the costs incurred by Service Company to provide such Services to the Client Companies.

3.3.2.- Procedure for the notification of the price of the Services and invoicing

During the term of this Agreement, before December 31 of each year, Service Company shall notify Client Company of the estimated price of the contracted Services for the following year (hereinafter, the "Estimated Price"), calculated in accordance with this Agreement.

For each year of each term of this Agreement, Service Company shall issue an invoice to be paid on the payment date to its corporate account in U.S. Dollars, or by any other means of

payment as may be agreed on by the Parties, for the Services rendered (as detailed in the relevant Appendix A) during the preceding year, based on the costs incurred in such year.

The invoice shall include written notice of the final price (hereinafter, the "Final Price") for the Services provided.

Within fifteen days of receipt of the invoice, the Client Company may make comments or inquiries to the invoice. The Parties shall try to resolve any disagreements, but in the event of a disagreement that is ongoing for more than fifteen days, any Party may exercise the rights provided to them in Clause 10 hereof.

Within the fifteen days following the determination of the Final Price in line with the preceding paragraph, the relevant adjustment invoice shall be issued for the Services, and the Party having to pay the difference shall do so on the payment date to the corporate account, in US Dollars, or by any other mean of payment as may be agreed on by the Parties, subject to the issuance of the relevant adjustment invoice in respect of the Final Price.

The Final Price shall include the applicable taxes, as well as any expense incurred by Service Company in connection with providing the Services.

3.3.3.- Regulatory Approval

Service Company and Client Company acknowledge that the regulatory commission of the appropriate jurisdiction has the right to review the amount of compensation to be paid by Client Company hereunder.

3.3.4.- Independent Audit

The Parties agree that Client Company shall be entitled to conduct an independent audit of the cost of the Services and the criteria applied to calculate the annual price of the Services provided to the Client Company (hereinafter, the "Independent Audit").

The Client Company may request the above Independent Audit in writing within the sixty days following the receipt of the notification from Service Company of the price of the Services according to clause 3.3.2, and Service Company must provide the Client Company with all the information and documentation requested in connection therewith.

4.- CONFIDENTIALITY

All of the information received by each Party from the other under this Agreement and provided in connection with the Services, shall be confidential in nature and may not be used for purposes other than those contemplated in this Agreement, unless otherwise agreed upon by the Parties.

The Parties undertake, in relation to the above information, to safeguard it diligently and not to disclose it to any third party without the consent of the other Party, other than to consultants, contractors, advisors or other service providers ("Advisors") in conjunction with the provision or performance of the Services. In any such case, the Party disclosing the

information to such Advisors shall ensure that such Advisors assume the confidentiality undertaking provided for herein.

Notwithstanding anything to the contrary in this Agreement, the Parties may use and disclose such information when required to do so in litigation, administrative, regulatory or other legal proceedings or as otherwise required by applicable law or to the extent required to do so by a governmental authority with jurisdiction over the disclosing Party; provided, that the disclosing Party must first provide notice to the other Party and afford the non-disclosing Party an opportunity to seek a protective order or other relief to prevent or limit disclosure of such information.

In connection therewith, when, as a result of the performance of the Services, Service Company gains access to commercially sensitive information from a Client Company, Service Company, in accordance with applicable law, shall adopt the necessary measures to maintain the confidentiality of such information.

The provisions of this clause shall apply while the Agreement remains in force and for a period of two years after its termination, other than when the confidential information becomes publically known for reasons other than a breach by a Party of its obligations hereunder.

5.- TRANSPARENCY

Service Company and Client Company shall inform the regulators of the transactions performed among them under this Agreement, if requested and required by applicable law.

6.- NOTICES

All notifications among the Parties in connection with this Agreement shall be made in writing and delivered by hand with written acknowledgement of receipt by the other Party or by fax, post, or e-mail, as well as any other means, provided that a record is at all times made of receipt by the addressee.

7.- SEVERABILITY

Should any court or competent authority declare null and void any of the provisions of this Agreement, the whole document shall remain in force, other than such void and null provision(s).

8.- MODIFICATION OF THE TERMS OF THE AGREEMENT AND ASSIGNMENT

8.1.- Modification

The terms of this Agreement may only be amended by written agreement between the Parties.

8.2.- Assignment

All of the rights under this Agreement are exclusive to the Parties and may not be assigned without the prior written consent of the Parties.

9.- TAXES

Each Party shall, at its own expense, pay all applicable taxes, based on applicable law. Each Party also shall provide to the other, in a timely manner, any documents and information that may be requested that may assist in the preparation of any tax filing or planning.

10.- DISPUTE RESOLUTION

10.1.- Previous negotiations

In the event that any conflict or dispute arises among any of the Parties in connection with this Agreement, the Parties shall enter into negotiations in order to try to resolve it by mutual agreement within thirty days, or any other period as may be agreed on between the Parties.

11.- APPLICABLE LAW

This Agreement shall be governed by the laws of the State of New York.

12.- ETHICS

Each Party shall conduct itself in accordance with the highest ethical standards and principles.

13.- ENTIRE AGREEMENT

This Agreement includes all of the agreements, terms, and conditions agreed on by the Parties regarding its subject matter, and supersedes any other prior agreement or conversation between the Parties in relation to such subject matter.

This Agreement may be executed (such execution to be evidenced by either signature or electronic consent consistent with federal and state law on electronic signature) in any number of counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

IN WITNESS WHEREOF, the Parties have signed this Agreement in the place and as of the date first above written.

Service Company

AVANGRID SERVICE COMPANY

By: _____
Name: _____
Title: _____

By: _____
Name: _____
Title: _____

Client Company

NECEC TRANSMISSION LLC

By: _____
Name: _____
Title: _____

By: _____
Name: _____
Title: _____



APPENDIX A: CATALOGUE OF CORPORATE AND TECHNICAL SERVICES

APPENDIX A1 – CORPORATE SERVICES

Services in Buildings and Leases: includes the activities related to the management of real estate assets necessary to the main activity of the Business and office buildings to guarantee their optimum function and conservation from the planning and space management, development and construction and ongoing operation

Main activities:

- Asset Management:
 - Asset and Land management functions, with activities such as: registration of properties, legal procedures, appraisals and valuations, capital gains, compulsory purchases, consultancy, support in the divestment of real estate assets, etc.
- Management of Buildings:
 - Management of leases, management of common area maintenance, etc.
 - Development of new office buildings through advising in the areas of urban planning, architecture, construction, and image. Construction, refurbishment and improvement works (operations) in corporate buildings.
 - Space management: design implementation and management of processes and activities to ensure efficient management of spaces and work environments.
 - Maintenance and operations of buildings:
 - Cleaning Services and other non-technical maintenance.
 - Corrective and preventive maintenance.
 - Supply of electricity, gas, water and furniture in work centers
 - Maintenance and gardening
 - Management and control of waste produced in work locations
 - Residence management
 - Management of residences and other non-corporative buildings and assets.

Cost driver: number of employees at each Client Company that occupy space in corporate and leased buildings.

Mobile Telephony: this service caters to the mobile communications requirements, for both voice and data, of Client Company users who request this service.

Management of the Mobile Telephony Service comprises of the following functions:

- User demand management
- Incident attention and technical support.
- Control, supervision of inventory and report on consumption of services
- Research and standardization of new technologies.

Cost driver: amount of annual telephony consumption per Client Company.



Office Services: design, implementation and support in the management of support service processes in work centers.

Main activities:

- Office Automation Points: management of automation points for printing, scanning and fax services for collective use in work centers, including:
 - Rental
 - Maintenance
 - Office material and IT consumables
- Office Staff Recruitment: support services at work centers:
 - Auxiliaries
 - Telephone operatives
 - Travel management
- Mail, dispatch and courier services:
 - Mail and pre-paid franking services within Spain
 - Internal mail or dispatch
 - Urgent dispatch of documents to locations not served by internal mail
- Document management:
 - Management of internal files
 - Management of external file storage
- Office Materials: supply of office materials to employees at their workstation.
- Publications and Subscriptions: management of subscriptions and purchase of publications.
- Translations: management of translations.
- Audio visual and Reprography Services:
 - Support and management services for audio visual resources in offices and meeting rooms
 - Printing and reprography service
- Work Clothes:
 - Centralized management of work clothes

Cost driver: number of employees at each Client Company.

Fleet Management: this service includes management of rental contracts, fuel, and application of policy regarding replacement, renewal and adaptation of the fleet

Cost driver: number of vehicles at each Client Company



Telephone Lines: this service caters to landline communications requirements, for both voice and data, of Client Company users who request this service

Cost driver: number of employees at each Client Company

General Services Management: These are all of those activities included in Real Estate and Property Management, Employee Services, Document Management, Economic and Budget Coordination, and Information Systems Management and Coordination. These activities result in the definition of global policies and procedures.

Also included are the activities derived from the integration projects of new companies in the Avangrid Group and their subsequent coordination, control and monitoring: initial analysis, comparative analysis of the global corporate model, search for operational and economic synergies, support in the implementation of the corporate model and integration of services with the rest of the companies of the Avangrid Group.

Cost driver: number of employees per Client Company

Surveillance and Maintenance of Buildings: design, implementation and support in the management of processes required to guarantee the security of the Client Companies' assets, carrying out ongoing analyses of possible risk scenarios, and recommending implementation of the necessary prevention and protection measures.

Main activities:

- Corporate Identification: identification of employees and visitors for access to, and time spent at the facilities of the Companies.
- Maintenance of Security and Fire Equipment: maintenance and upkeep of fire equipment and other security equipment, including:
 - Definition and implementation of safety measures regarding physical and electronic media
 - Adaptation of fire detection and suppression systems in accordance with current legislation
 - Management of control service for the alarm switchboard and remote centers
- Lighting and Emergency Plans: guarantee compliance with current legislation through maintenance and updating of lighting systems and emergency plans
- Processing of Documentation: maintenance of necessary equipment and procedures to guarantee confidentiality of information.
- Surveillance: surveillance and control of accesses at the facilities of the Companies.
- Certification in Quality Management: processes for obtaining and maintaining the quality certification of security systems of the Companies.



Cost driver: number of employees at each Client Company that occupy space in corporate and leased buildings.

International and Corporate Security: main activities, understanding that the concept/word SECURITY takes into account the following:

- Physical/Asset Security
 - VIP Protection
 - Electronic Security
 - Data Protection
 - Intelligence
 - Fire Protection
 - Emergencies
 - Quality Management
-
- Analysis of the impact and conditions of the application of the *Corporate Security Policy*'s adaptation to the real environment (legislation, social environment, political and economic situations).
 - Country risk analysis in relation to SECURITY.
 - Coordination and supervision of the definition and implementation of SECURITY measures
 - Coordination and supervision of the maintenance of SECURITY equipment.
 - Coordination and supervision of the SECURITY planning:
 - Prior to implementation
 - During the implementation process
 - In operation
 - Development and implementation of contingency plans for people and assets in the abovementioned phases.
 - Technical advice to Client Companies on SECURITY matters.
 - Implementation of special services and executive security for both short and long term travel in destination countries
 - Definition, support and supervision in the establishment of the SECURITY structure necessary to ensure the management and control of security risks in destination countries
 - Coordination and supervision of human resources, internal and external, dedicated to SECURITY.
 - Coordination and supervision in the standardization of SECURITY technology and operations.
 - Coordination and supervision of economic and budgetary management in accordance with the Group's guidelines.
 - Provision of information services and security recommendations during business travel for employees of the Client Company.

Cost driver: number of employees per Client Company



Other Security Services: includes other security services as:

- Cyber Security: Define cyber security and data privacy strategy, policies and standards, technical and architecture security requirements and guidelines for Cyber Security.
- NERC Compliance: Ensure compliance with the NERC Reliability Standards. Create and maintaining a documentation framework that supports compliance, and includes clear processes, policies, and procedures
- Threat & Incident Management: Lead corporate incident response team. Identifies critical incidents through data gathering of internal and external threats

Cost driver: number of employees per Client Company

Human Resources Management: comprises activities related to management and definition of policies and procedures with reference to the services provided by Human Resources.

Cost driver: number of employees per Client Company

Training and Recruitment: Main activities

- Design and implementation of development actions linked to the skills model and to the group of employees with potential.
- Assessment of employees with potential and key people
- Management of the training plan and on-site and on-line training
- Welcome and integration plans
- External and internal recruitment and selection.
- Recruitment of students under work placements.

Cost driver: number of employees at each Client Company

Labor Relationships, Remuneration and Welfare Benefits: Main activities:

- Definition, coordination and monitoring of the implementation and application of policies and models regarding remuneration and benefits.
 - Design and management of remuneration programs.
 - Coordination, support and monitoring of remuneration policies and systems.
- Definition of criteria, comparison groups for benchmarking and market surveys (compensation, benefits and other elements).
- Development of indicators for offers of total compensation.



- Definition of the internal controls on both the valuation and accounting of assets (benefits inventory, data base, assumptions, dual contrast valuations, actuarial reports, assets certification, checks by individuals, independent checks), for the preparation of Pension Disclosure from Financial Statements to ensure the disclosure of the appropriate information is disclosed in the consolidated Financial Statements and of each company.
- Optimize the cost of risks and obtain the best conditions when contracting life insurances, AD&D, disability, healthcare insurances, mutual insurance and social insurance programs, and the like, through the use of the necessary tools, resources and structures, and monitoring of the benefits policy.
- Detect and define risks mitigations alternatives (defined benefit plans closure to new entrants; freezing, if applicable of past services in defined benefit plans; outsourcing of risk through insurance companies; ...).
- Labor relations and organization:
 - Preparation and negotiation of collective bargaining agreements
 - Labor law advisory services
 - Coordinating, providing support and monitoring of committees deriving from the collective bargaining agreement and complementary regulations.
 - Drafting of job descriptions and basic functions
 - Coordinating, providing support and monitoring the organization.
 - Definition of recruitment criteria
- Employee welfare and other social benefits.
 - Management of pension plans and social assistance.
 - Definition, development and management of the different individual and collective restructuring plans
- Welfare benefits.
 - Design and administration of welfare benefits: Christmas presents, assistance for disabled children of staff members, study grants, special advances, employee energy price, seniority bonuses, and, in general, any benefit capable of being implemented or agreed.

Cost driver: number of people in each Business or organization

Occupational Risk Prevention and Company Healthcare: Main activities:

- Training in occupational risk prevention
- Audits and inspections of facilities and work
- Assistance to occupational risk prevention work groups
- Shop floor advice on occupational risk prevention
- Processing, investigation and information on accidents
- Definition of policies and general criteria for company medical services
- Organization and planning of preventive healthcare actions
- Health monitoring through medical check-ups for employees



- Healthcare function for non-occupational accidents and diseases
- Incapacity management

Cost driver: number of employees at each Client Company.

Internal (Corporate) Communications: comprises all the activities related to internal communications for AVANGRID employees and its client companies. This gathers:

- Development of the Group's strategy
- Content management Employee Portal
- Realization of global campaigns (Christmas, labor climate survey, global projects)
- Preparation of global contents (Newsletter, financial results, etc.)

Cost Driver: number of employees per Client Company, considering all the employees of the Group.

R&D&I: provision of the tools, resources and structures necessary to ensure a suitable setting for innovation development. In line with this, the services offered are as follows:

- **Strategic R&D&I plan**: coordination and support for Client Companies in the definition and monitoring of their innovation plans.
- **R&D&I Committees**: coordination of R&D&I committees at the Client Companies.
- **Tax deductions**: support in managing the procedure for the application of tax deductions through meetings with all Client Companies. Administrative procedures.
- **R&D&I grants and subsidies for projects and human resources**. Support with grant applications for different programmes and performance of administrative formalities. Representation of Client Companies before institutions related to Innovation, and funding bodies.
- **IBERDROLA Innovation Network**: coordination of this initiative.
- **R&D&I Management System**: establishment of the strategy for IBERDROLA Innovation management. Definition of the R&D&I Management System in accordance with the UNE 166002 standard.
- **Knowledge management**: development and coordination of Teams of Experts together with the Client Companies.
- **Technological Platforms**: coordination of the presence of the Client Companies on European and Spanish technological platforms.
- **Industrial and Intellectual Property Management System**: its function is to promote, manage and coordinate the management of industrial and intellectual property, and to perform administrative formalities to protect the results of projects.
- **Technological Monitoring**. Provided by the Technological Monitoring and Intelligence Office, it allows users of the Client Companies to receive alerts on technological areas that could interest them, as well as specific reports requested on certain technologies or



processes. Definition of the Technological Monitoring System in accordance with the UNE 166006 standard.

- **Innovation communication:** to make the Client Companies' efforts in innovation visible both inside and outside the company: news, innovation awards, surveys, etc.
- **Innovation Training:** collaboration with Corporate Training in the establishment of training actions to develop innovation skills (creativity, R&D&I management, etc.)
- **Universities:** Coordination of the relation between Client Companies and universities for the development of initiatives, projects or reports demanded by Client Companies.

Cost driver: basic budget for tax deductions for R&D&I activities (2/3) and investments in R&D&I at each Client Company (1/3).

Quality: the services offered are as follows:

- Quality Committee: organization of the Committee of Quality Coordinators.
- Advice on and implementation of ISO 9001.
- Performance of audits under ISO 9001
- Preparation of reports for presentation to excellence awards of the Client Companies.
- Management of the Excellence Award for suppliers (international level).

Cost Driver: number of quality systems implemented or in the process of being implemented at each Client Company business unit/company.

Environment: promotion and development of environmental initiatives in Client Companies. In this regards, the main services offered in this area are as follows:

- Environmental planning: support to the Client Companies in defining and monitoring their environmental plans. Definition of the international environmental guidelines.
- Environmental Committee: organization of the Committee of environmental coordinators
- Tax deductions: support in managing the process for the application of tax deductions for environmental reasons. Administrative formalities.
- Environmental grants and subsidies for projects. Support in managing and preparing reports for grant applications for the different programs and performance of administrative formalities.
- Environmental Management System, according to ISO 14000: environmental management strategy according to the ISO 14000 standard. Support in managing internal and external audits. Monitoring of nonconformities. Creation of the Global report.
- Environmental scorecard: support in managing indicators and investments and expenses at a global level.
- Emissions inventory: calculation of the global emissions and performance of the inventory audit according to ISO 14064.
- Environmental initiatives: launch and implementation of environmental projects.



- Biodiversity initiatives: launch and implementation of biodiversity projects.

Cost Driver: environmental investment and expenses (60%) and Certification 14000 under SGAI (40%).

Brand Management: this refers to all activities related to licenses for use of the brand by the Client Companies:

- Registration management for brands and web domain names: creation and registration management and protection of registered marks; monitoring and renewal of brand registrations, in order to guarantee adequate legal protection in each case; resolution of queries in this area.
- Assignment of full use of the web domains belonging to Avangrid. In these cases, the subsidiary will assume full management of the content of the respective website and, as a result, expressly assume full responsibility for its content, stating this in the legal notice on the website.
- The hosting service, which should allow one-click access to the Client Company's website from the Avangrid website, meaning that, in light of the high number of visitors to the Avangrid website, the Client Company benefits from a greater visibility.
- Brand materials:
 - Creation and distribution of criteria applicable to the brand and corresponding logos, providing advice, resolving queries and attending to individual requests in light of the need for specific formats.
 - Design of necessary elements for the correct application of the brand: provision of templates or sketches where the brand has a fundamental role in cases where it is not possible to resolve doubts at source in order to guarantee the correct application of the brand, as well as possible co-existence with other brands. For example: signage of offices and industrial facilities, inaugurations, institutional relations, public events, trade fairs, etc.).
 - Advice and design of promotional and sponsorship materials, providing the version of the brand which best fits the space available and colours used in order to ensure the best match among the colour range used and ensure the best visibility of the brand in each piece, as well as coherence with the brand values.
- Advice on labelling and signage: both inside and outside of buildings, centres, sub-stations, vehicles and in general of any element, using illuminated signs, vinyl signs, boards, stickers, etc.
- Office image and signage: coordination of signage needs in order to comply with what is established in the brand manual, solving potential problems, providing pertinent advice and taking charge of updating and translating the manuals regulating office signage, monitoring that the signage complies with what is established in the manuals.
- Corporate identity elements: monitoring of all elements where the brand plays a fundamental role (posters, books, brochures, videos and DVDs) or at events (public events, trade fairs and congresses, etc.). The use of these elements will require the Client



Company to respect the manuals regulating the corporate identity in corporate publications, stationery, advertising, internal videos, events, signage and promotional elements, etc., for the correct application of the brand.

- Promotional materials: support, resolution of queries and supervision of the correct application of the brand in these elements, as well as its coherence with the brand positioning and values, Recommendation of the most suitable logo according to the element in question and resolution of any queries that may arise.
- Brand Center Management and Service: The “Brand Center” is an online tool which covers all needs in connection with the management of the various Brands currently held by the Avangrid Group in all countries in which the company is present and which, through the management and direction of the Brand Management Department, serves the various representatives of the local Brands in each country: archives, manuals, final arts, projects and global application control.
- Digital look and feel, user experience design and information architecture for corporate websites: support, resolution of queries and supervision of the correct application of the corporate web design of Avangrid to the Client Companies’ corporate websites, as well as its coherence with the corporate digital positioning of the brand. The Client Company is required to respect the manuals, criteria and guidelines regulating the corporate digital identity.

Cost Driver: Average of the dimension at each Client Company according to the Assets, personnel expenses & Gross Margin (Massachusetts Formula)..

External Communication: includes the following activities:

- External and stakeholder communications
- Media relations
- Reputational risks and tracking of company reputation
- Community engagement activities

Cost Driver: Amount of annual expenses in advertising, sponsorships, hospitalities and public relations

Business General Administration and Regulation Services: comprises the activities of management and definition of policies in each of the businesses of Iberdrola group, as well as proposal and development of plans and initiatives for defense of, and advice on, compliance matters under examination from market Regulatory Bodies. Functions:

- Coordinate the businesses of Iberdrola group in each of the countries where it operates
- Ensure that all administrative acts of the Regulatory Bodies are carried out in line with the law



- Suitable defense of the interests of the Client Companies in the market
- Support in the development of regulatory proposals, providing support with international evidences.
- Advice to the Client Companies on compliance matters providing global knowledge in the defense of positions.
- Support in complying with regulations in the pursuit of overseas business opportunities and in international tenders.

Cost driver: Average of the dimension at each Client Company according to the Assets, personnel expenses & Gross Margin (Massachusetts Formula).

Control Services:

- Support in the preparation of the appropriate economic and financial information for the monitoring of the Client Companies.
- Coordination of the drafting and integration of operational plans and of the annual budget of the Client Companies, as well as the analysis and follow up of the accomplishment level.
- Coordination of the development, implementation and updating of the internal control model in the client companies to reasonable assure the reliability of the financial information.
- Analysis and monitoring of the degree of compliance with the operational plans and the approved annual budget.
- Analysis of the added value and profitability of investment proposals by the Client Companies on the basis of the plans' targets as well as other operating assets or cash generation units.
- Preparation of the economic and financial information required by external institutions
- Issue accounting policies and the framework for accounting processes, as well as advice on them.
- Coordination of the development, implementation and updating of the intercompany corporate services billing model in the Client Companies with their own clients.
- Improvement of administrative-economic control processes.
- Consolidation of financial information

Cost driver: Average of the dimension at each Client Company according to the Assets, personnel expenses & Gross Margin (Massachusetts Formula).



SAP Platform: management of the SAP corporate platform in the General Administration, Personnel Administration, Procurement Administration and Logistics areas:

- Collection of new functional requirements, design of specifications and transfer to systems for construction,
- Parameterization of the system
- Performance of mass processes and control of interfaces
- Maintenance of users and access profiles
- Definition, construction and provision of information extraction tools to users
- Planning and implementation of training for end users

Cost driver: number of SAP platform users by Client Company

General Administration: performance of general administration procedures in accordance with commercial, tax and labor legislation. Activities:

- Accounts administration procedures
- Registration, conformation and payment of third-party invoices once authorized by the Client Company
- Service to suppliers
- Bank reconciliation
- Invoicing of inter-company transactions
- Invoicing of other revenues to third-parties
- Accounting of administrative transactions

Cost driver: number of documents processed at each Client Company.

Personnel Administration: performance of personnel management procedures in accordance with labor legislation and with the internal procedures of Human Resources. Activities:

- Payroll development and management:
 - Payroll updates (staff joining/leaving, modifications)
 - Changes in labor situation
 - Opening of work centers
 - Social insurance
 - Inland revenue procedures (tax deductions, documentation, etc.)
- Processing of payroll variables
 - Processing of monthly activity reports, travel expense sheets, minor payments.
 - Corporate VISA
 - Processing of ILT (Temporary Incapacity to Work)
 - Maternity and paternity benefits



- Staff assistance service and management of welfare benefits:
 - Telephone assistance to employees
 - Management of employee tariff
 - Management of collective life insurance
 - Processing of meal vouchers
- Management of pension plan:
 - Monthly contributions
 - Changes of capital
 - Modification of conditions

Cost driver: number of employees at each Client Company

Taxation Services: The tax services consist of the following activities, taking into account that, if the recipient of the services has its own local tax team, the applicable tax services of those listed below will be provided on a supplementary and support basis to the activities carried out by said local team.

- Development of the *Good Tax Practices Policy*
- Definition of the tax risk strategy of the Client Companies
- Management of the tax treatment of the Client Companies calculating their taxes and managing their tax returns and their taxes
- Defense of the interests of the Client Companies in tax inspections
- Tax assessment of the Client Companies, planning investment/disinvestment processes, businesses restructuring processes, and devising and developing money-saving options
- Representation of Client Companies before the tax authorities and in professional forums
- Collaboration with the persons responsible for preparing the economic information, advising on the preparation of tax information at annual and periodic closes.
- Coordination of the support from external advisors on particularly significant tax issues
- Coordination of the Transfer Pricing Policy
- Tax Technology: operation of the corporative systems and interfaces between these and all the specific tax systems for the aforementioned activities.

Cost driver: Average of the dimension at each Client Company according to the Assets, personnel expenses & Gross Margin (Massachusetts Formula)

External Audit: includes the audit activities of financial information, performed by external companies

Cost driver: Average of the dimension at each Client Company according to the Assets, personnel expenses & Gross Margin (Massachusetts Formula)



Purchasing Service: procurement of equipment, materials, goods and services provided to the Client Companies on the best service conditions with the aim of obtaining the most favorable purchasing conditions, through the use of the necessary tools, resources and structures and in compliance with the Procurement Policy, the appropriate proceedings and the applicable law.

To this end, Purchasing refers to the comprehensive purchasing service that includes the following, among other activities:

- Purchase planning based on the Client Company's needs plan
- Selection, rating and analysis of suppliers
- Issuing the request for quotation
- Receiving and evaluating offers
- Negotiation with suppliers
- Drawing up the proposal of award
- Identification and negotiation of contractual terms and conditions and documents
- Issuing and signing orders and/or contracts in accordance with the amount and the powers granted by the Client Company
- Evaluation, negotiation and amendment of contractual terms and conditions negotiated due to any extensions and changes of scope that arise during the supply or provision of the service
- Coordination or management purchasing category

Coordination services by purchasing category: For those supplies that require a specialization and coordination at the group level, the category manager will bring the knowledge and define strategy based on best practices along the group

Purchasing support service: includes the following, among other activities:

- Aggregate purchase planning for the group and coordination thereof, and identification of possible synergies
- Ongoing analysis of purchases by the group to identify the most frequently purchased products and to adopt measures to cut down the costs and improve efficiency
- Promote necessary actions with suppliers and contractors in accordance with the requirements established in the annual corporate social responsibility plans at the Avangrid Group level
- Register, rate and analyze suppliers and contractors in accordance with requirements in the area of quality, environment, occupational risk prevention, respect for human rights, credit risk and corruption
- Ensure optimal functioning and efficiency in purchasing processes and the supporting IT tools
- Keeping information on management, control and reporting on the Group's purchases.
- Ensuring the purchasing coordination at group level reporting to the different purchasing and business committees
- Creating key performance indicators or a scorecard for the Group's purchasing area as a whole.



Cost driver: amount of purchasing requests per each Client Company (value of open POS)

Insurance services: Management, at the request of and in conjunction with the Client Companies, of operational risks:

- Identification of operational risks: operation and exploitation, acquisition of companies, new activities, projects, legislation, agreements, etc.
- Analysis of operational risks: exposure to risk, calculation of probable maximum losses (PML), analysis of frequency and severity.
- Management of degree of retention and transfer of operational risks.
- Prevention (inspections/ recommendations)
- Agreements (liability, warranties, force majeure, insurance clauses, etc.)
- Arrangement of insurance programs.
- Management of policies under purchased insurance programs
- Loss management
- Hiring of advisors in the areas of risk management and placement of insurance (brokers).
- Preparation and management of insurance budget.

Cost driver: amount of policies per each Client Company

Financial services: management, at the request and in coordination with Client Companies, of the following aspects.

- Financial planning
 - Preparation of the long-term financial plan
 - Preparation of the short-term financial budget and adjustments throughout the year
 - Preparation of the Macroeconomic and Market hypotheses
- Financial reporting
- Financing
 - Arrangement of short- and long-term bank financing.
 - Arrangement of short –and long-term financing on capital markets.
 - Arrangement of structural financing.
 - Management of inter-company financing.
- Treasury
 - Payments and collections using appropriate payment methods.
 - Medium-term cash projections.
 - Banking reconciliation and calculation of daily position.
 - Regulation of liquidity, management of cash deficits and surpluses.



- Negotiation, contracting and issuance of letters of credit, cash collaterals and guarantees.
- Opening and closing of bank accounts.
- Risk management
 - Interest rate risk management
 - Exchange rate risk management
- Back Office for financing, cash and risk management
 - Confirmation, administration, accounting of transactions and accounting close.
 - Execution of payments.
 - Banking reconciliation of financing transactions
 - Compliance with, and control of, contractual obligations (covenants)
 - Financial audit process.
 - Control of the tax treatment of financial transactions.
 - Preparation of individual and consolidated financial statements and other corporate information.
 - Development and maintenance of IT systems and help desk.
 - Declarations to Central Banks and cooperation in compliance with international regulations.
 - Interest and expenses billing.
 - Management of documents.

Cost driver: Weighted percentage of the following concepts per each Client: Company

- Intercompany Financing Average balance (assets and liabilities) as well as debt with third-parties
- Number of guarantees processed
- Number of bank statement entries
- Equalization for all businesses

Risk Management: includes the following activities

- Enterprise Risk Management: Risk Identification and analysis, development of Risk Policies and limits, Monitoring of limits, indicators and key risk
- Credit Risk: Analysis and monitoring of counterparty credit worthiness and exposures
- Market Risk: Analysis of markets, open positions, prize curves, etc.
- Project Risk: Risk analysis of projects, relevant operations, insurance programs, etc.

Cost driver: Average of the dimension at each Client Company according to the Assets, personnel expenses & Gross Margin (Massachusetts Formula)



Investor Relations:

- Implement and develop the global relations model with investors of Iberdrola Group. Set up the requested channels in order to side the institutional communication with the strategy of Iberdrola Group and Avangrid.
- Prepare information and presentations to analysts: operational data, presentations of results, strategic presentations, etc.
- Devise the valuation model of Avangrid.
- Organize events to help the market know better the Company and optimize its valuation. Attendance to investment banking seminars, roadshows, etc.
- Make use of Iberdrola Group knowledge in the preparation and development of meetings with analysts and investors.
- Maintenance of relations and attendance to meetings with rating agencies.
- Competitors, markets and relevant business analysis.
- Coordination with both Corporate and Local areas: Management and Control, Communication, Businesses, etc.
- External Communication and information delivery.

Cost driver: Average of the dimension at each Client Company according to the Assets, personnel expenses & Gross Margin (Massachusetts Formula)

Development Services:

- Development functions (services to parent company)
 - Identify, analyze and execute non-organic growth opportunities at corporate or business level
 - Identify, analyze and execute asset disinvestments in core business except for financial shares and non-energy businesses
 - Monitor competitors including their non-organic growth strategies and disinvestments
 - Keep permanently in touch with corporate investment banks and financial advisors in order to identify investment opportunities, know their opinion about the existing alternatives in relation to non-organic growth, and get explanations and assessment on corporate development operations
 - Analyze and monitor the most important countries, their enterprises and energy assets
 - Negotiate and execute both alliances and strategic operations with third companies if it's considered between the competences conferred to Development



- Generate financial models at a corporate level
 - Dialogue with authorities on the aim of developing a lobby focused on M&A and both disinvestment and non-organic investment concrete project execution
 - Support Public Entities on the delivery of macroeconomic, operational or financial information
- Development functions (provided to other areas)
 - Support other Corporate Functions in tasks related to Corporate Development such as, investor relations, flotations, etc.
 - Service to businesses and subsidiaries in several activities: business development, regulatory advice, asset/companies acquisition/disinvestment, etc.
 - Support to Regulation in preparing rate cases, providing relevant information.
 - Support to greenfield projects in progress.

Cost driver: Average of the dimension at each Client Company according to the Assets, personnel expenses & Gross Margin (Massachusetts Formula)

Legal services:

- Advice on the establishment and implementation of, and compliance with, preventive legal security systems, appropriate decision-making processes and coordination and information mechanisms among the various companies.
- Coordination with external firms.
- Advice on corporate transactions.
- Cooperation in maintaining relationships with notaries, registries and other public offices.
- Cooperation in the suitable management of legal risks by aiding in the identification, evaluation and provision of legal advice on such risks.
- Cooperation in providing advice on law and legal defense in general, including tax and regulatory fields.
- Assistance in the processing of lawsuits in the defense of companies, directly or by contacting external firms.
- Advice for the implementation and updating of the Corporate Governance System and its development rules.

Cost driver: Average of the dimension at each Client Company according to the Assets, personnel expenses & Gross Margin (Massachusetts Formula)



Internal Audit: includes internal audit activities for local Audit & Compliance Commission, chairman or organization. Participation in global audits for corporate functions and businesses.

Cost driver: Average of the dimension at each Client Company according to the Assets, personnel expenses & Gross Margin (Massachusetts Formula)

Compliance: includes the following activities:

- Ethics, fraud and offense management
- Implement compliance program for applicable Federal and State Regulation
- Implement program for the Separation of Activities of Regulated and Unregulated businesses

Cost driver: Average of the dimension at each Client Company according to the Assets, personnel expenses & Gross Margin (Massachusetts Formula)

Governing Bodies: includes the activities of the chairman, CEO, CEO's Office and Board of Directors, related to the management of the company

Cost driver: Average of the dimension at each Client Company according to the Assets, personnel expenses & Gross Margin (Massachusetts Formula)

IT workstation: the PTI (IT workstation) service covers all activities and services concerning the availability and correct functioning of IT workstations.

The Workstation General Service includes the following components:

- Supply and installation of the workstation.
- Maintenance of the workstation (according to criticality).
- Renewal of the workstation.
- Network Services.
- Platform-based applications, personal productivity software and business applications.
- Access to the Employees' Web Portal and applications published on it (Travels, office supplies, IT requests and incidents, etc.).
- Access to different business web portals and to applications published on them.
- IT Stations for general use.
- Accessibility.
- Centralised software licences.
- IT support for customers (as appropriate).
- Inventory as support system.
- Administration of users and resources included in Systems processes.
- Collaboration services in real time (business Skype)



- Personal data service (Sharefile)

Additional Workstation Services:

- Migration and/or conversion of user data.
- Destruction of Client information registered on magnetic media.
- Extension of storage capacity for individuals or work groups, on storage servers.
- Special service timetable subject to request and analysis.
- Remote connection to network infrastructure via platform equipment with VPN client and WebVPN access to published applications, if any.
- Access to Metaframe environment applications (check service file for further information).
- Connection and access to information systems outside Avangrid.
- Training of Client Company users on handling elements pertaining to the configuration of the Workstation.
- Access to Knowledge Management Systems.
- Corporate server backup of user data stored on laptop or desktop systems, subject to defined space limitations, and always communications permitting.
- Installation of Departmental Applications as requested by the installer (DAI).
- Transfer of files (to/from the exterior) via the corporate FTP.
- Analysis of impact and requirements derived from the application of the Cybersecurity Risk Policy.

In short, this service includes all activities necessary to provide, integrate and support the hardware, software and connectivity required by end users to enable them to manage their information and access what they need from the information systems for which they are authorized by the competent bodies of their respective companies.

Cost driver: number of systems (desktop, laptop, tablet PCs) weighted by unit price and local or global cost components, at each Client Company.

New developments: this service comprises new information systems or applications software, as well as maintenance and correction of pre-existing ones, regardless of the hardware/software platform they require.

Cost driver: Number of users of each application / Number of persons / others, per each Client Company

Operation and support: this service covers all activities necessary for the management and administration of infrastructure elements, to ensure functioning and operability in the Systems environment. It also includes the information and communications protection service, developing and implementing, pursuant to the instructions received from the Client Companies, suitable



prevention and protection measures that guarantee inaccessibility of systems information by unauthorized persons, and monitoring possible security breaches of information systems.

Additionally the services includes Finishing and Printing Center with all activities related to printing tasks (printing service, creation and modification of forms, and finishing service)

Cost driver: percentage of operation consumption according to the services received per each Client Company

IT Systems Management: comprises activities related to management and definition of policies and procedures with reference to the services provided by IT area. This gathers all the activities of IT Workstation, Operation and Support, and New Developments.

Cost driver: number of employees per Client Company.

Data Center: the provision of physical data center facilities and infrastructure to clients.

This service encompasses all of the services and facility related components or activities that support the implementation, maintenance, operation, and enhancement of the data center. The data center provides processing, storage, networking, management and distribution of data within Client Companies.

Cost driver: Average of the dimension at each Client Company according to the Assets, personnel expenses & Gross Margin (Massachusetts Formula) for companies utilizing the data center.

Any other specific support requested by client company that would be directly monitored and charged



APPENDIX A2 - TECHNICAL SERVICES

Executive Service: include general and administrative management and strategic planning.

Governmental Affairs Service: include monitoring, reviewing and researching legislation and lobbying government officials.

Regulatory Management Service: include coordination of the Client Companies' rates and regulatory economics departments including rate-related compliance matters.

Transmission and Supply Service: include activities related to the coordination and direction of electric and/or gas transmission, storage, and supply functions.

Distribution Operation Service: include activities related to the coordination and direction of electric and/or gas distribution operation functions.

Customer Service: include call center operations including responding to Client Companies' customer calls, customer billing, accounts receivable, credit and collections services, customer satisfaction monitoring and management of low income programs.

Engineering Service: include centralized customary engineering services including design engineering, general engineering, construction engineering and GIS technology development, meter services and testing and operations.

Commodity Planning Service: includes coordination and direction of gas or electric supply planning and procurement at utility or non-utility companies.

Other centralized service: dedicated solely to AVANGRID Networks businesses.



APPENDIX C: AVANGRID CORPORATE AND TECHNICAL SERVICES

COST ALLOCATION MAUNUAL

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3. APPLICABLE REGULATION	5
4. CORPORATE SERVICES' BILLING PROCEDURE	6
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6. FLOW OF COSTS THROUGH THE CASCADE MODEL	11
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1. PURPOSE

The purpose of this document is to describe the process by which the costs of corporate services at the Iberdrola Group are identified and billed to different companies they serve or are benefited by these services. Avangrid has adopted the same model.

In general, corporate services are classified in services provided on behalf of the Shareholder and services provided to the Group companies.

The services provided on behalf of the shareholders are not billed unless they are recognized by regulators as necessary for the operation of the concession, while the services provided to the Group companies are billed to each of the companies receiving such services.

The services provided to a single company are billed directly to that company, while services provided to more companies are allocated to these companies according to "drivers" defined for each of the services consumption.

The billing of corporate services to the Group companies is performed following transparent and objective criteria consistent with the principle of market value, avoiding any discrimination, subsidy or competitive advantage. These criteria are of general application, and are based on the benefit generated in the client companies of these corporate services, and applied objectively and consistently based on non-manipulable data.

The cost base used is built according to consistent criteria of the transfer pricing guidelines of the Organization for Economic Cooperation and Development (OECD).

The procedure defined herein is applicable to all companies of the Iberdrola Group, subject to the consideration and adaptation to the particularities of each jurisdiction, which must be duly justified in each case.

2. ONE CORPORATION MODEL

The presence of the Iberdrola Group in different countries and business sectors has made convenient the implementation of a business model based on a decentralized structure of decision-making that, however, allows a global integration of Business according to the Group's business model. This Model, adopted by the Board of Directors of Iberdrola SA, is aimed at maximizing the operational efficiency of the different business units and ensures the dissemination, implementation and monitoring of the overall strategy and basic management guidelines established for each business, primarily through the exchange of best practices between companies of the Iberdrola Group.

One of the key instruments of the Group business model is the "One Corporation" which Iberdrola set up to provide certain corporate services in an efficient and flexible way to all companies of the Iberdrola Group.

The costs of the One Corporation are structured in two types:

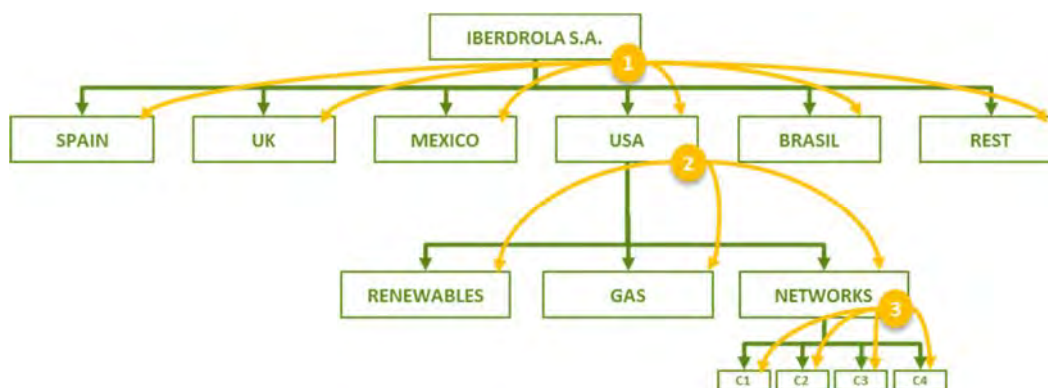
- Corporate services costs: These are the costs recorded in the provider companies, and needed to provision the corporate services. These costs are the subject of the present billing model.
The billing of these costs will require a contract and the subsequent determination of the services that will be provided to each society.
- Costs managed directly by each company that receives the services: The costs of these services are managed by each company according to common guidelines across the Group in order to exploit common synergies and improve purchasing power.

The Corporation ensures proper provision of contracted services by following the instructions provided in the Declaration of Acceptance by the Client Companies in their corresponding Framework Agreement. The services must respect the standards set in the context of the One Corporation to ensure adequate synergies and maximize operations of the Group. Also contracted services are rendered in full compliance with applicable law and the Corporate Governance System and the distribution of tasks and responsibilities derived therefrom.

The One Corporation is structured by corporate services providers companies, both at Group level and at the level of countries and businesses within each country.

Each company providing corporate services is organized by corporate functions (more detail in Annex 5.1.).

Service delivery is made according to the following scheme (the detail included in USA intended to serve as an example, although the pattern is repeated in each country and each business within each country):



Services are provided in cascade, from top to bottom, from the lending companies of services to clients' related companies. As a general premise, no services are provided from the client companies to headers (bottom-up), or between companies of different Holdings (horizontally).

CORPORATE FUNCTIONS EMPLOYEES: ALLOCATION CRITERIA

Employee assignment principle: 80/20

- If an employee works 80% or more of the time for a single company, then this employee is assigned to that company.
- If an employee works more than 20% for several companies, then this employee is assigned to the Service Company:

3. APPLICABLE REGULATION

The cost billing process from the Corporation to the Group companies follow the guidelines issued by the OECD in 1995 and supplemented in 1996 (with periodic updates) for the regulation of related party transactions and that are applicable for the purposes of Article 7 CSA common services in Iberdrola. The arm's length principle is the internationally accepted standard to assess the transfer prices of related party transactions. The most commonly cited arm's length principle definition and how to apply it is also defined in the OECD Guidelines. That legislation comes to the conclusion that the results of this operation are to be similar to those they would have obtained between independent entities have done under similar or comparable circumstances.

The guidelines published by the Joint Transfer Pricing Forum in the European Union (FCPTUE) analyzing the treatment and analysis of low value-added services as part of related party transactions must also be followed. That legislation provides guidance in relation to the analysis of low value-added services (support services management) with related entities.

On the other hand, Article 18 of the Corporation Tax Act, BOE number 288, pages 96972-78, dated November 28, 2014, determined the valuation rules of related party transactions, defining the scope thereof and establishing the method for determining the market price of each of these operations.

Finally, in the North American environment, there must be compliance with the requirements of the regulations of the Federal Energy Regulatory Commission (FERC), including Part 367 of Title 18 of the US Code of Federal Regulations ("CFR 18") in connection the uniform system of accounts in companies providing centralized services ("uniform System of accounts for Mutual service Service Companies and Subsidiary companies")

4. CORPORATE SERVICES' BILLING PROCEDURE

The steps used for billing services are:

1. Services' Costs Identification – Corporation Costs Base
2. Service to companies and on behalf of the shareholder or the concession
3. Client companies
4. Services' consumption drivers
5. Self- Consumption and final billing

4.1 SERVICES' COSTS IDENTIFICATION – CORPORATION COSTS' BASE

As a general principle and within the corporate SAP platform, all costs associated with the activities of each company, both own personnel expenses, external suppliers' costs, depreciation and others, are analytically accounted in the so-called "allocation orders". Each order among its different analytical fields collects a product code that identifies the corresponding corporate service.

Cost base of Iberdrola Group corporate service is defined as the Earnings Before Interest and Taxes (EBIT). The EBIT includes the following components:

- Personnel Expenses
- Net External Services of other operating income
- Taxes
- Depreciation
- Provisions

The External Services component will include both items received from external companies of the Group and items from different Group companies of the Corporation and necessary for the provision of corporate services.

As an exception to the direct allocation of costs to products, indirect costs are those that due to their nature or the way in which they are accounted on the Corporation can't be assigned to a single corporate service. In this case a consumption criterion has to be used in order to assign it to the corporate services affected.

4.2 SERVICE TO COMPANIES AND ON BEHALF OF THE SHAREHOLDER OR THE CONCESSION

The services provided by the Corporation are classified into two groups:

- Services provided on behalf of the shareholder: services that, according to the rules of the OECD, are provided to shareholders. These services (see details in Annex 5.3.) are not billed unless they are recognized by regulators as necessary for the operation of the concession.
- Services provided to the Group companies: services provided to Group companies. In general, the amounts for services provided to Group

companies are billed to each recipient company by the corresponding consumption driver (see details in Annex 5.2.).

However, there are services that can be billed directly to a client company:

- Personnel services or External Service of the Corporation to a Group company in singular Investment projects (so-called "*Recharge*")
- Services provided by the Corporation to particular projects, to outside companies or where Iberdrola Group has a majority stake.
- Assignment of staff of the Corporation to companies.

Both the services provided on behalf of the shareholders and services to Group companies are related to the corporate functions that provide them (see details in Annex 5.3. and Annex 5.2.).

4.3 CLIENT COMPANIES

Corporate services are provided generally to all group companies where it holds the majority stake or where Iberdrola, not being the majority shareholder, is the responsible for the management.

There is a framework agreement for the provision of services, the companies concerned and the billing forecast of year in force.

As previously explained, the billing of services to each company is performed through the corresponding corporate services' providers companies (cascade).

This means that every service is billed to each of the companies' providers of corporate services at the next level, and then from each of them, their own cost of each service is added and billed to the next level, and so on until each company receiving the service.

In cases where companies have corporate service providers that do not add value to the services of the previous level, services are billed directly to the lending companies that add value next level or if there are none, to the host companies of the services.

The corporate services providers companies in each country are:

- Iberdrola España S.A.
- SPW Power UK Plc
- Avangrid Service Company
- Iberdrola Energía Altamira de Servicios, S.A. de CV
- Iberdrola Brasil S.A.

All beneficiary companies are directly or indirectly attached to the Framework Agreement.

4.4 SERVICES' CONSUMPTION DRIVERS

Corporate services provided to Group companies are calculated using each service a driver of consumption (see detail in Annex 5.4 drivers.).

These drivers are defined taking into account indications of the OECD and the EU Joint Forum, best practices of other similar companies, and those that better reflect the consumption of each service (see details of services and drivers used in Annex 5.5.).

In those cases where it is not possible to use a specific driver to ensure equity in consumption costs between host companies of the service, a driver of overall consumption has been defined. This driver, commonly called "Massachusetts formula" is used widely in the US for utilities to assign costs to the host companies based on their dimension.

4.5 SELF-CONSUMPTION AND FINAL BILLING

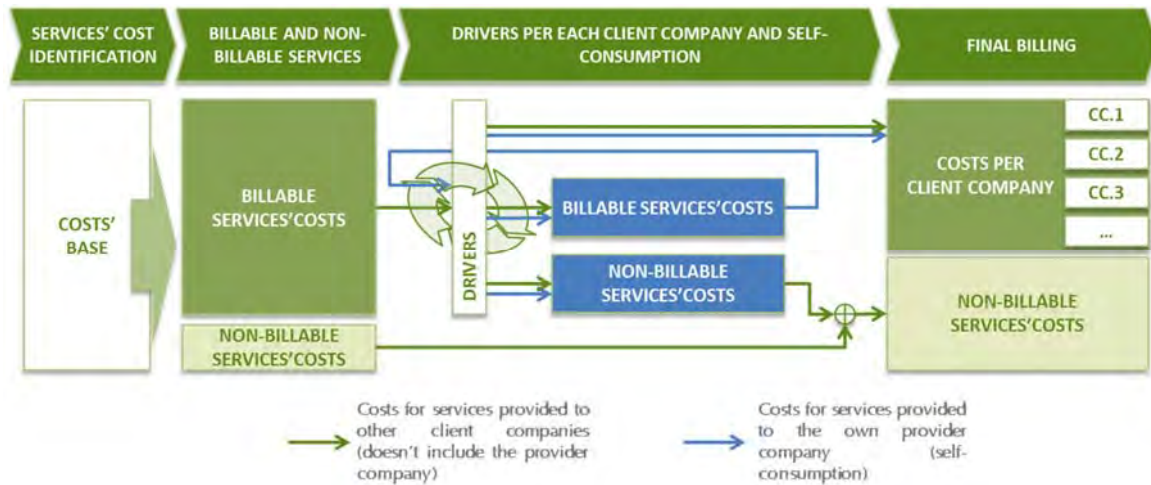
The different corporate services (to companies and on behalf of the shareholder or the concession) include initially their own costs for providing their services to the companies receiving them. However they don't include costs of other corporate services they make use of.

For example, Purchasing service initially includes purchasing department own costs to provide services to the companies receiving them. However, it is necessary to add the costs of "consumption" which makes the Purchasing Department itself relative to other corporate services (Office services, IT Workstation, General Administration, etc.). These expenses for consumption between corporate services are called "self-consumption".

To calculate the cost of self-consumption, these steps are followed:

- Consumption of each service is calculated at each consumer entity. In this calculation, the provider of corporate services is among the consumers, as it has employees who also receive corporate services.
- These own consumption of corporate services are divided into two groups:
 - o Consumption associated with services provided to the shareholders or the concession: These consumptions are not billed unless they are recognized by regulators as necessary for the operation of the concession
 - o Consumption associated with other services: These consumptions are integrated again between the receiving services which are billed by applying the same consumer drivers.
- This process is performed iteratively until corporate services receive no cost via self-consumption (amount <0,01 €) and all consumption is assigned to the target companies or non-billable services.

The following chart shows schematically the process of billing for services rendered:



The price for the provision of each of the services corresponds to market price determined by any method accepted in the applicable laws and regulations including the cost without margin itself, under appropriate circumstances are given, and calculated annually based on the cost incurred for the provision of those services to client companies.

5. NON CORPORATE FUNCTION TECHNICAL SERVICES

Certain Services are provided outside of the Corporate Services model using similar allocation methods. These services are referred to as technical services and usually are business specific in nature. For example in the United States the regulated Networks Companies have identified shared services outside of the corporate model that follow a very similar allocation method.

5.1 TECHNICAL SERVICES DESCRIPTION

The purpose of this section is to describe the process by which the costs of technical services at the Avangrid Networks Group ("Group") are identified and billed to different societies they serve or are benefited by these services.

The services provided to a single company are billed directly to that company, while services provided to more companies are allocated to these companies according to "drivers" defined for each of the services consumption.

The billing of technical services to the Avangrid Networks Group companies is performed following transparent and objective criteria consistent with the principle of costs, avoiding any discrimination, subsidy or competitive advantage.

The cost are determined in accordance with applicable rules and regulations, including the Energy Policy Act of 2005 and applicable state regulation, which require Service Company to fairly and equitably allocate costs among all

associate companies to which it renders services (collectively, the "Client Companies"), including Client Company.

The procedure defined herein is applicable to all companies of the Avangrid Networks Group, subject to the consideration and adaptation to the particularities of each jurisdiction, which must be duly justified in each case.

Finally, in the North American environment, there must be compliance with the requirements of the regulations of the Federal Energy Regulatory Commission (FERC), including Part 367 of Title 18 of the US Code of Federal Regulations ("CFR 18") in connection with the uniform system of accounts in companies providing centralized services ("Uniform System of Accounts for Mutual Service Companies and Subsidiary Companies")

5.2 TECHNICAL SERVICES' BILLING PROCEDURE

The steps used for billing services are:

- Services' Costs Identification — Technical Costs Base
- Service to companies
- Client companies
- Services' consumption drivers
- Self- Consumption and final billing

5.2.1 SERVICES' COST IDENTIFICATION – TECHNICAL COSTS BASE

As a general principle and within the corporate SAP platform, all costs associated with the activities of each company, both own personnel expenses, external suppliers' costs, depreciation and others, are analytically accounted in the so-called "allocation orders". Each order among its different analytical fields collects a product code that identifies the corresponding corporate or technical service.

Cost base of Iberdrola Group corporate service is defined as the Earnings Before Interest and Taxes (EBT). The EBT includes the following components:

- Personnel Expenses
- Net External Services of other operating income
- Taxes (Other than Income Taxes)
- Depreciation
- Provisions
- Net Finance Costs

The External Services component will include both items received from external companies of the Group and items from different Group companies of the Corporation and necessary for the provision of corporate services.

As an exception to the direct allocation of costs to products, indirect costs are those that due to their nature or the way in which they are accounted for by the Corporation can't be assigned to a single corporate service. In this case a consumption criterion has to be used in order to assign it to the corporate services affected.

5.2.2 SERVICE COMPANIES

Services provided to the Group companies: In general, the amounts for services provided to Group companies are billed to each recipient company by the corresponding consumption driver.

However, there are services that can be billed directly to a client company:

- Personnel services or External Service of the Corporation to a Group company in singular investment projects (so-called "*Recharge*")
- Services provided by the Corporation to particular projects, to outside companies or where Iberdrola Group has a majority stake.
- Assignment of staff of the Corporation to companies.

5.2.2 CLIENT COMPANIES

Technical services are provided generally to all Group companies where Avangrid Networks holds the majority stake or where Iberdrola, not being the majority shareholder, is responsible for the management.

There is a framework agreement for the provision of services, the companies concerned and the billing forecast of year in force.

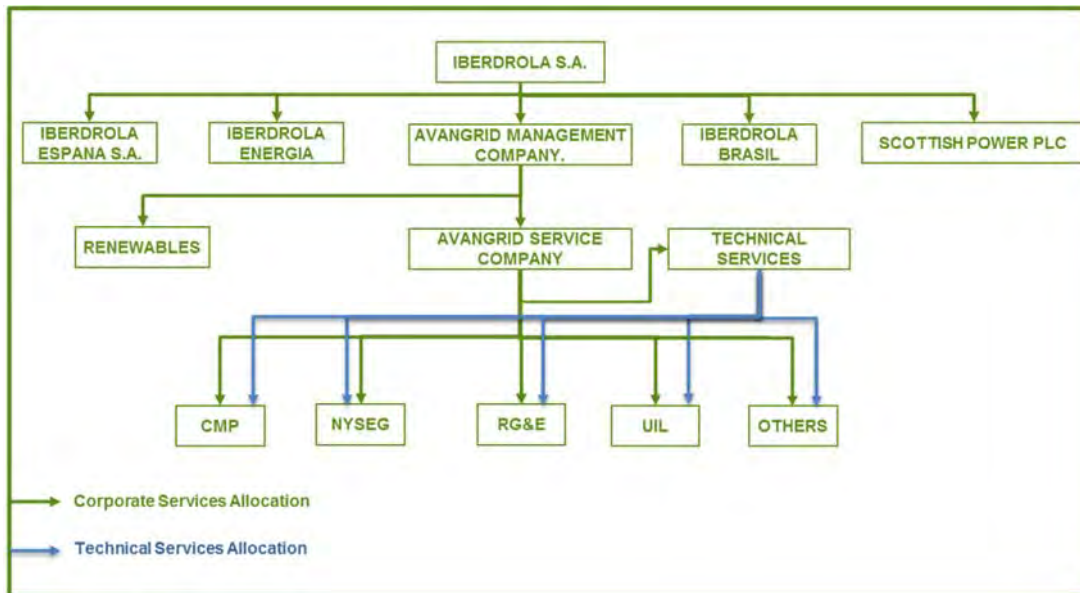
The major technical services provider companies are:

- Avangrid Service Company
- Central Maine Power Company
- Maine Natural Gas Corporation
- New York State Electric & Gas Corporation
- Rochester Gas and Electric Corporation
- UIL Holdings Corp.
- The United Illuminated Company
- Connecticut Natural Gas Corporation
- The Southern Connecticut Gas Company
- The Berkshire Gas Company
- The New York Transmission Company
- NECEC Transmission LLC

6. FLOW OF COSTS THROUGH THE CASCADE MODEL

As referenced above service charges flow in a cascade model in which the Service Provider of a parent company (lending company) full loads and allocates their cost base down to the companies below it. If the charge goes to a final destination company (this company does not provide services for any other company within the group) the expense remains within that company. If these charges are allocated to a sub level service company these charges are then gathered with the cost base of that service company and billed down until

they are finally allocated down to a final destination company. For example a charge from the Iberdrola Service Company could go through many different allocation cycles before it reaches its final destination company. A charge could potentially originate at the IBERDROLA SA Service company level, be allocated to AMC, then be allocated to ASC, then allocated to the technical service provider and then finally to one of the final destination networks companies. In this scenario a charge would be included with the base cost of the service company and allocated by applicable driver.



7. ANNEXES

7.1 CORPORATE FUNCTIONS

CORPORATE FUNCTION
Governing Bodies
Innovation, Environment and Quality
Real Estate and General Services
Corporate Security
IT
Human Resources
Purchasing
Insurance
Finance & Treasury
Risks
Capital Management
Investor Relations
Control
Administration
Tax
External Audit
Secretary of the Board
Communications
Legal Services
Corporate Development
DG Business and Regulation
Internal Audit
Compliance

7.2 SERVICES TO CLIENT COMPANIES

CORPORATE FUNCTION	SERVICE
Innovation, Environment and Quality	R+D+I Service
	Environment
	Quality
Real Estate and General Services	Services in buildings and leases
	Mobile Telephony
	Telephone lines
	General Services Management
	Fleet Management
	Office services
Corporate Security	International and Corporate Security
	Surveillance and maintenance of buildings
	Other security services
IT	IT Management
	IT Workstation
	Operation and support
	Data Center
	New developments
Human Resources	Human Resources services
	Training & recruitment
	Labor relationships
	Occupational risk prevention
	Internal Communications
Purchasing	Purchasing services
Insurance	Insurance services
Finance & Treasury	Financial services
Control	Control services
Administration	General Administration
	SAP Platform
	Personnel Administration
Tax	Tax services
Communications	Brand Management
Legal services	Legal services
Corporate Development	Development services
	Development projects
DG Business and Regulation	DG Business and Regulation services

7.3 SERVICES ON BEHALF OF THE SHAREHOLDER OR THE CONCESSION

CORPORATE FUNCTION	SERVICES
Governing Bodies	Governing Bodies
Human Resources	Other HR services
Risks	Other financial services
Investor Relations	
External Audit	External audit
Secretary of the Board	Governing Bodies
Communications	External Communications
Internal Audit	Internal Audit services
Compliance	Compliance services

7.4 TECHNICAL SERVICES

FUNCTION	SERVICES
TECHNICAL SERVICES	Executive Services
	Governmental Affairs
	Regulatory
	Transmission and Supply
	Distribution Operations
	Customer Service
	Engineering Services
	Commodity Planning
	Other Centralized Services

7.5 SERVICES' CONSUMPTION DRIVERS

DRIVER	CALCULATION METHODOLOGY
Weighted percentage of R+D+I service per organization	Budget base for tax deductions due to R+D+I activities (2/3) and investments in R+D+I on each business (1/3)
Percentage of Environment Investments and expenses per organization	Environment Investments and expenses (60%) and 1400 Certification in SGAI (40%)
Number of quality processes per organization	Number of implemented or on-going implemented quality processes per organization
Percentage of carbon tons	Carbon tons per organization
Number of employees in corporate buildings	Number of active employees in corporate buildings per organization
Phone consumption amount	Phone consumption amount per organization
Number of vehicles	Number of vehicles per organization
Number of persons per organization	Number of persons per organization
Number of shares	Number of shares per organization
Dimension Indicator (Massachusetts formula)	Weighted dimension of each organization taking into account Gross Property Plant, Direct Labor and Gross Margin (Application of Massachusetts formula)
Number of weighted equipment	Number of laptops, desktop computers, PDA's and pocket-PCs that according to the inventory are associated to employees of each organization. With this inventory a weighting is made taking into account the purchasing value of each of the equipment. Besides a correction factor is added to some equipment in order to weight the local costs of IT Workstation
Percentage of consumption per organization	Number of MIPS y percentage of storage utilization per each application, and number of users of the application
Number of users	Number of users of the application per organization
Amount of orders per organization	Amount of orders per organization
Amount of policies per organization	Amount of policies per organization
Weighted percentage of financial operations	Weighted percentage of the following concepts per each Client: Company <ul style="list-style-type: none"> • 78,5% Intercompany Financing Average balance (assets and liabilities) as well as debt with third-parties • 5% Number of guarantees processed • 15% Number of activities processed • 1,5% Equalization for all businesses
Number of SAP users	Number of SAP users per organization
Number of documents processed per organization	Number of documents processed per organization

Amount of expenses in advertising, sponsorships, hospitalities	Amount of annual expenses in advertising, sponsorships, hospitalities and public relations
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7.6 RELATION OF SERVICES AND DRIVERS

CORP. FUNCTION	SERVICE	DRIVER
Governing Bodies	Governing Bodies	Dimension Indicator
Innovation, Environment & Quality	R+D+I Service	Percentage of R+D+I service
	Environment	Percentage of Environment Investments and Expenses
	Quality	Number of quality processes
Real Estate and General Services	Services in buildings and leases	Number of employees in corporate buildings
	Mobile Telephony	Phone consumption amount
	Telephone lines	Number of persons
	General Services Management	Number of persons
	Fleet Management	Number of vehicles
Corporate Security	Office services	Number of persons
	International and Corporate Security	Number of persons
	Surveillance and maintenance of buildings	Number of employees in corporate buildings
IT	Other security services	Number of persons
	IT Management	Number of persons
	IT Workstation	Number of weighted equipment
	Operation and support	Percentage of consumption
	Data Center	Dimension Indicator
Human Resources	New developments	Number of users / persons / other
	Human Resources services	Number of persons
	Training	Number of persons
	Labor relationships	Number of persons
	Occupational risk prevention	Number of persons
Purchasing	Corporate Communications	Number of persons
Insurance	Purchasing services	Orders Amount
Finance and Treasury	Insurance services	Policies amount
Risks	Financial services	Financial operations amount
Investor Relations	Other financial services	Dimension Indicator
Control	Control services	Dimension Indicator
Administration	General Administration	Number of processed documents
	SAP Platform	Number of SAP users
	Personnel Administration	Number of persons
Tax	Tax services	Dimension Indicator

Communications	External Communications	Amount of expenses in advertising, sponsorships, hospitalities
	Brand Management	Dimension Indicator
Legal Services	Legal Services	Dimension Indicator
Corporate Development	Development services	Individual analysis
	Development projects	
DG Businesses and Regulation	DG Businesses and Regulation service	Dimension Indicator
External Audit	External Audit	Dimension Indicator
Secretary of the Board	Governing Bodies	Dimension Indicator
Internal Audit	Internal Audit services	Dimension Indicator
Compliance	Compliance services	Dimension Indicator

SERVICE TYPE	SERVICE	DRIVER
Technical Services	Executive Services	Dimension Indicator
Technical Services	Governmental Affairs	Dimension Indicator
Technical Services	Regulatory Management	Dimension Indicator
Technical Services	Transmission and Supply Services	Dimension Indicator
Technical Services	Distribution Operations	Dimension Indicator
Technical Services	Customer Service	Dimension Indicator
Technical Services	Engineering Services	Dimension Indicator
Technical Services	Commodity Planning	Dimension Indicator
Technical Services	Other Centralized	Dimension Indicator



Exhibit C

Recent transmission projects completed by CMP and other Avangrid Networks operating subsidiaries

MAINE

Central Maine Power Company (CMP)

CMP's most recent experience with design, development and construction of transmission and substations includes, among others:

- Construction Completed (2010-2018) – Maine Power Reliability Program (MPRP): To meet NERC TPL Reliability Standards and ISO-New England PPL “Reliability Standards for the New England Bulk Power System,” CMP invested \$1.4 billion to reinforce Maine’s transmission grid through upgrades and new construction between 2010 and 2018. MPRP added approximately 450 miles of new transmission lines (184 miles of 345 kV and 256 miles of 115 kV), five new 345 kV substations, and expansions to six existing substations between the Town of Eliot on the New Hampshire border and the Town of Orrington, where it connects to transmission lines from northern and eastern Maine.
- Construction Completed (2018-2019) – Coopers Mills Substation in Windsor: CMP installed a new +/-200MVAR STATCOM device, a static compensator which is the largest of its kind in North America, that monitors voltage variations and power disruptions throughout the New England grid and adjusts in milliseconds to help prevent outages and enable faster restoration if there is an outage by stabilizing the system. In 2013, the Coopers Mills Substation, an 18-acre 345/115/34.5/13.8 kV substation, was completed as part of CMP’s Maine Power Reliability Program (MPRP).
- In Project Closure (2018-2020) – Waterville-Winslow Reliability Phase II (County Road Substation, Section 241, Section 281, Section 127, Section 38, Section 56 and distribution circuits 873D1 and 873D2, Oakland, Waterville, Fairfield, Benton).
 - Replaced the existing Rice Rips Substation with a new 115kV/34kv/12kV substation that is now called County Road. The 12kV phasing was converted to CMP standard phasing so that future circuit ties can be made.
 - Upgraded the existing single tap 115kV transmission line Section 241A to two lines of looping transmission in and out of County Road Substation. The Section 241A transmission corridor was widened by 30 feet to allow a new 115kV transmission line of approximately seven (7) miles to be constructed parallel with the existing Section 241A. The final configuration consists of two (2) 115kV transmission lines as follows: Section 281 (rerated) from County Road to Lakewood substation and Section 241 (new construction on steel poles) from County Road to Heywood Road substation.
 - The existing 34kV transmission line Section 56 now loops in and out of County Road Substation to create Section 56 from County Road to Winslow substation. The Section 56 feeds the Fairfield Substation. A new Section 127 feeds the West



Waterville Substation. The addition of the Section 127 adds redundancy to the Waterville 34.5kV transmission loop and separates the Fairfield and West Waterville Substations on separate 34.5kV transmission lines. Three (3) miles of distribution (12kV and 34kV) was also rebuilt.

- In Construction/Progress (2019-2021) – NERC Alert (numerous sections) Priority III lines. To comply with the 2010 NERC Alert mandate to correct all conductor-to-ground clearances that do not meet National Electrical Safety Codes (NESC), CMP is working on identified poles, anchors, and dead ends and replacing them with new, taller wood structures on 41 115kV transmission lines totaling 530 miles.

NEW YORK

New York State Electric & Gas (NYSEG)

NYSEG's most recent experience with design, development and construction of transmission includes, among others:

- Construction Completed (2017) – Auburn Transmission Project (ATP): A new 115kV transmission line and a 115kV transmission upgrade. The new 14.5-mile Line 710 runs north from State Street Substation in the City of Auburn through the Town of Throop, and then runs east to the Elbridge Substation through the Towns of Brutus, Sennett and Elbridge and the Village of Elbridge. This was followed by bus work on two existing National Grid 115kV circuits which tie into the existing rebuilt NYSEG Line 972.
- Construction Completed (2020) – Columbia County Transmission Project (CCTP): A new 115/34.5kV substation, two new 115kV transmission lines which tap into an existing high voltage transmission line, and two new 34.5kV distribution lines.

Rochester Gas & Electric Company (RG&E)

RG&E's most recent experience with design, development and construction of transmission and substations includes, among others:

- Construction Completed (2017) – Ginna Retirement Transmission Alternative: A major upgrade to Station 122 and Station 80, including replacement of 345kV/115kV transformers, replacement and reconfiguration of 345kV substation equipment, and upgrade of medium voltage transmission lines. The project increased the capacity of 15.5 miles, three 35.5kV underground transmission lines, and 1.5 miles of 11.5kV underground transmission lines.
- In Progress (2017-2020) – Rochester Area Reliability Project (RARP): Construction, reconstruction, operation, and maintenance of approximately 27.6 miles of 345kV and 115kV transmission lines; improvements to three existing substations in the towns of Gates and Henrietta, and the City of Rochester; the construction of one new 345/115kV substation (Station 255) in the Town of Henrietta off East River Road; and upgrades within the fenced-in areas to existing substations in the towns of Lewiston and Somerset in Niagara County.



CONNECTICUT

United Illuminating Corporation (UI)

UI's most recent experience with design, development and construction of transmission and substations includes, among others:

- Completed (2018) – Baird Substation Rebuild: Construct and operate a new open air-insulated 115/13.8-kV distribution substation to address several compliance and aging infrastructure needs.
- Completed (2018) – Pootatuck Capacitor Bank: As part of the continuing effort to maintain and improve the reliability of the electric transmission system in southwestern Connecticut ("SWCT"), reconfigure the existing Pootatuck Substation, a 115-kV to 13.8-kV distribution substation located in the City of Shelton, Fairfield County, Connecticut, in order to add another 115-kV source and 115-kV capacitor bank. The proposed modifications included the addition of equipment within the existing substation fence to accommodate a second 115-kV transmission line loop through the substation, as well as the installation of two new steel monopole structures located within an existing Eversource Energy right-of-way that extends across UI property adjacent to the substation.
- Completed (2017) – Mix Avenue Capacitor Bank: Modifications to the existing Mix Avenue Substation located at 690 Mix Avenue, Hamden, Connecticut and related improvements to existing electric transmission line circuits from Mix Avenue Substation to Glen Lake Junction and from June Street Substation to Pease Road.



Exhibit D

Resumes of Key Personnel



Thorn Dickinson

Professional Profile

CEO and President, NECEC Transmission LLC.

Education

B.S. in Electrical Engineering. Union College, Schenectady, NY.

Master in Business Administration. Syracuse University, Syracuse, NY

Current Position

2019-present CEO and President – NECEC Transmission, LLC.

- Responsible for development and construction of approx.. \$1B HVDC electric transmission project in Western Maine.

Experience

2011-present Vice President – Business Development

- Responsible for creating and supporting business development and growth initiatives for Iberdrola USA. Growth initiatives include both green field development and mergers and acquisitions.
- M&A transactions included Connecticut Natural Gas, Southern Connecticut Gas, Berkshire Gas, Hartford Steam, NYSEG Solutions, Energetix and New Hampshire Gas.

2002-2011 Director Risk Management

- Assess and address the causes and effects of uncertainty and risk throughout the organization.
- Apply a variety of financial and statistical analysis and modeling approaches to accurately assess and make decisions about risk.
- Acquire adequate and cost-effective risk financing for property, casualty, professional and environmental exposures for the company and its subsidiaries and oversee the claims management process.
- Identify the company's critical processes and ensure that there are tested contingency plans in place to restore those processes in case of a disaster.

1997-2002 Manager – Investor Relations

- Effectively communicate corporate strategy, financial results and expected performance to the investment community.
- Provide management information on financial markets, investor perspectives and peer performance.
- Develop, coordinate and present information to the investment community.

1997-2003 Manager of Rates and Revenue Requirements

- Responsible for state revenue requirement issues.
- Responsible for rate design development.



New York State Electric & Gas Corp., Binghamton, NY

1994-1997 Coordinator – Cost Support & Pricing

- Responsible for cost studies that support pricing strategies, profitability analysis, and regulatory compliance.
- Responsible for the testimony related to cost analysis in state and federal proceedings.
- Led a cross functional team charged with the development and application of models for the purposes of evaluating the risks and opportunities of a restructured competitive environment.

1991-1994 Staff Engineer – Planning & Procurement

- Performed financial analysis on supply and demand resources. One example of this analysis includes the analysis of how the corporation should comply with the Clean Air Act.
- Negotiated power purchase contracts with Non-Utility Generation. Kept these projects under control and moving forward from the initial contact with the developer through the contractual, engineering, construction, testing, commercial operation, and closeout phases of the project.

1988-1991 Field Engineer

- Managed a group responsible for the construction, operation, and maintenance of power delivery systems.
- Developed construction schedules, budgets, and determined manpower requirements for capital projects.
- Responded to customer concerns regarding voltage problems, system reliability, and equipment failure.
- Met with customers, other utilities, state, and county officials to coordinate work and to obtain permit approvals and easements.

Angel Aparicio Martin

Professional Profile

Director of Integrated Projects, Avangrid Network.

Education

Master Degree in Engineering. ALFONSO X EL SABIO University, MADRID
EXECUTIVE- MBA. SIMON BUSINESS SCHOOL, ROCHESTER University, NEW YORK

Current Position

2016 – Present Senior Director of Integrated Projects Avangrid Networks – Projects:

- NECEC HVDC Project \$950m
- Ginna Retirement Transmission Alternative Project (GRTA, \$150m) management.
- Rochester Area Reliability Project (RARP, \$290m) management.
- BES (Brightline \$2,000 m) management.

Experience

2015 – 2016 Manager IIC. Managing Iberdrola Investment planning portfolio, Madrid:

- Simultaneous leadership of third-party team and Iberdrola Spain investment plan team.
- Compliance with the investment plan exceeding the annual production and profit targets by around 20%.
- Systematization of the use of MS-Project.

2012 – 2015 Manager IEP. Managing IUSA Investment Planning Networks Portfolio, New York:

- IEP team development and leadership, managing the IUSA investment plan.
- Design and implementation of projects management protocols, procedures and tools such as MS-Project and 3P. Tools currently used by Avangrid.

2007 – 2012 Country Manager East-Europe, Network & Business Development, Bulgaria and Romania:

- Opening of new Iberdrola Ingeniería y Construcción headquarters in Bulgaria and Romania
- T&D project management with budget above 40M €.
- First EPC Wind Farm Project, IIC awarded, Romania, Chirnogeni, 115M€

Iberdrola Ingeniería was awarded in Romania with the first wind farm project including the wind turbines (EPC model). Project Completion according the plan in term of time schedule and costs.

2005 – 2005 Testing & Commissioning, ST La Laguna 115 kV, CCC La Laguna, Mexico:

- ST La Laguna Testing & Commissioning, Torreon, Mexico. Period of completion of 10 weeks. Management Team of 15 Engineers and Technicians. Strategic project for Iberdrola Generación México and Iberdrola Ingeniería.

2002 – 2007 Plan Madrid Portfolio, Construction and Project Management, Madrid:

Management of reconstruction, dismantling, electromechanical works as well as testing and commissioning for the main substations (132, 220 y 400 kV) in the city of Madrid, Spain.



Adam M. Desrosiers

Education

2007 - Associate in Applied Science Degree – Architectural and Civil Engineering, Central Maine Community College, Auburn, ME

2011 - Project Management Certificate – University of Southern Maine, Portland, ME

Current Position

2018 - Present NECEC Project – Central Maine Power Company

- Responsible for overall execution of the 950M New England Clean Energy Connect Project
- Manage team of internal and external Engineers, Project Managers and Construction Mgrs.
- Coordinate with environmental and regulatory agencies for project approvals.
- Report progress and provide financial updates to executive management.
- Negotiate and manage large construction and material contracts.

Experience

2017 – 2018 Manager – Substation Operations – Central Maine Power Company Responsible for managing substations for all of CMP

- Manage team of substation supervisors and substation crews
- Plan and oversee annual capital substation budget in excess of 5M.
- Assist with storm response and unplanned customer outages
- Manage capital and O&M budgets for substation area
- Coordinate safety training and lead with accident investigations
- Coordinate resources with other Managers across all of AVANGRID Networks

2014 – 2017 Supervisor – Substation Operations – Central Maine Power Company

- Responsible for supervising and managing union substation crew
- Plan and oversee substation maintenance work and capital substation projects
- Ensure safe and efficient work is completed to company standards
- Assist with storm response and unplanned customer outages
- Manage capital and O&M budgets for substation area
- Coordinate safety training and assist with accident investigations

2012 – 2014 Manager – Electric Capital Delivery – Central Maine Power Company

- Responsible for managing and meeting the yearly capital budget of 95M
- Manage staff of internal Project Managers and track assigned project progress
- Manager PMOE contractor and onsite personal
- Report project and budget status to upper management
- Collaborate and coordinate between multiple consultants, engineers, contractors and regulatory departments.

2010 – 2012 Manager – Programs/Projects – Central Maine Power Company

- Work with planning to refine and define project scopes and budgets.
- Oversee construction of projects and ensure QA/QC processes and specifications are being followed



- Develop RFP packages, review bids and assist in contract execution for projects
- Track and manage projects from conceptual plans to construction.
- Track/develop project budgets and schedule and report to upper management
- Collaborate and coordinate between multiple consultants, engineers, contractors and regulatory departments.

2008 – 2010 Supervisor – Construction/Maintenance – Central Maine Power Company

- Construction manage all substation and transmission line construction projects
- Schedule, plan and oversee system outages
- Coordinate with other company departments and contractors
- Enforce company safety requirements and quality control standards
- Order and receive necessary owner provided materials to complete project

2004 – 2008 Assistant Engineer – Spaulding Engineering.

- Manage and coordinate substation, hydro and facility projects for various clients
- Inventory, coordinate deliveries and receive materials on various substation projects
- Perform construction site Inspections and quality control operations
- Define scope of work and create design drawings with use of AutoCAD
- Assemble technical specifications for various construction projects
- Write weekly Construction Activity Reports
- Monitor and enforce client's safety policies

Hugo Alejandro Puig Barba

Professional Profile

Professional civil engineer, with a master's degree in project management with twenty years' experience in construction methods, concrete business, major EPC contracts, renewables and networks. Experience in Coordination of Technical, Civil and Quality departments, Project Controls.

Education

1997 – 1998 Civil Engineer Instituto Tecnológico de Estudios Superiores de Occidente, Guadalajara, Jalisco, Mexico.

2008 – 2010 Master in Project Management Euro MPM 2008-2010, University of the Basque Country UPV/EHU, Bilbao, Spain

Professional Engineer License 4246827

Current Position

June 2018 – Present Manager NECEC Project Control –AVANGRID Central Maine Power, USA

- Ensure that all budgeting, scheduling and coordination processes run smoothly.
- Perform risk management
- Monitor the progress of project to ensure that it is working within the confines of set deadlines and budget limitations.
- Generate progress reports to managers.

Experience

2015 – 2018 Iberdrola Energy Projects Salem Harbor Energy Center 674MW Combined Cycle Gas Turbine Power Plant, USA, served as Technical Office Senior Analyst responsible for Civil Works. Contract manager for civil and steel structure work. The new Salem Harbor Station is designed to achieve state-of-the-art levels of efficiency, converting more than 58% of the energy in gas to electrical power, the highest level of efficiency of any unit currently operating in New England.

- Achievements: Designed and executed a 40 ft. high precast firewall that improved the schedule in execution in half the original cast in place design.

2013 – 2015 Rochester Gas & Electric RGE: served as Portfolio Project Manager, project control for Electrical Capital Delivery Projects, Substations and Transmission Lines in Northwest New York.

- Implemented new macros for MS Project to manage schedule and cash flow all in one. Created database for quick and simplified reporting for Electrical Capital Delivery Projects; same database is now being implemented in our UK branch.

2012 – 2013 Groton Wind Farm 48MW 24 2MW Turbines: served Scheduler and Civil Supervisor.

2011 – 2012 Iberdrola Ingenieria y Construcción CC Koudiet 1.200 MW, Madrid, Spain:

- Responsible for the Metallic Structure and enclosures packages for mayor and minor buildings. Workshop quality inspections and supervision.



- Responsible for the construction department in bid for CC West Deptford 650 MW New Jersey, USA. Participation in the following bids (ESJ Wind Project, Tecate, Mexico, Cape Wind, East Cost, USA, CC Stalowa Wola, Poland and CC Centro I, Mexico).

2006 – 2011 Iberdrola Ingenieria de Explotacion, La Torre Iberdrola Bilbao, Spain: served as Civil Work and Quality Manager.

- Project management team quality and field engineer for structure, civil and architecture works.
- Audits and Quality inspections
- Project control

2001 – 2005 SOCOIN Grupo Union FENOSA, La Paz, Baja California Sur: served as Quality Coordinator in the following projects:

- Remodel and enlargement of Guadalajara International Airport
- Baja California Sur I Diesel Central 41,314 MW

2000 – 2001 Concretos Apasco, Tijuana, Baja California : served as Technician and Quality Supervisor and Coordinator responsible for:

- Technical and client support
- Quality supervision

1999 – 2000 Consider Obras y Proyectos, Guadalajara, Jalisco: served as project and field engineer responsible for:

- Bid packages
- Bid and award process
- Field quality control supervision

1998 – 1999 Construccion y control Integral de Obras CAMIADE, Guadalajara, Jalisco: Served as project and field engineer responsible for Project Construction of Bermo Inc. Inside Flextronics Technological 5000 m2 Industrial building.



Gerry J. Mirabile

Professional Profile

Thirty-two years' experience in environmental management, regulatory interpretation and administration, regulatory compliance, permitting, agency interaction, legislative work and field studies.

Education

2013 Master of Business Administration (MBA) Husson University, Bangor, Maine

2000 Master of Science in Business (MSB) Husson University, Bangor, Maine

1984 Bachelor of Science in Ecology (BS) Johnson State College, Johnson, Vermont.

Recipient, Award for Excellence in Ecology

Certifications

2008 to present. Erosion and Sedimentation Control Practices (Maine DEP)

Current Position

2017 – Present Manager NECEC Permitting –AVANGRID Central Maine Power, USA

Experience

2015 to 2017 Central Maine Power Company, Avangrid Networks, Augusta, ME

Manager – Programs/Projects & Supervisor, Environmental Compliance Department

2013 to 2015 Central Maine Power Company, Avangrid Networks, Augusta, ME

Manager – Programs/Projects, Environmental Compliance Group

1989 to 2013 Central Maine Power Company, Avangrid Networks, Augusta, ME

Environmental & Licensing Coordinator, Environmental Specialist,

Senior Environmental Specialist, Lead Analyst – Compliance

1985 to 1989 Maine Department of Environmental Protection, Augusta, ME

Conservation Aid, Environmental Specialist II, Environmental Specialist III

Professional Experience

Environmental

- Broad and detailed knowledge of environmental aspects and impacts of electric utility operations and practices.
- Manage consultants responsible for preparation of federal, state, and local permit applications for transmission/distribution lines, substations, service facilities, navigational aids, and submerged utilities.
- Advise AVANGRID staff and contractors on facility siting and permitting.
- Present project proposals to federal and state regulators, planning/zoning boards, city councils, and citizen groups.



- Monitor, evaluate, and develop testimony and comments on proposed environmental, land use, permitting, vegetation management, chemical release, regulatory reporting, wildlife and fisheries, zoning, stormwater, underground tanks, erosion control, and waste management legislation and regulations.
- Develop compliance plans and advise/train AVANGRID staff and contractors on project-specific permit conditions.
- Identify and oversee third-party inspectors and contracts; review and respond to third-party inspection reports for AVANGRID capital projects.
- Coordinate with USFWS and non-profits on New England Cottontail and American kestrel survey and enhancement efforts on CMP transmission line rights of way.
- Review and edit compensation site restoration and monitoring reports.
- Developed construction-phase and maintenance-phase sensitive and protected resource management plans for capital projects.

Communication and Regulatory:

- Drafted and submitted to regulatory agencies numerous summaries of environmental studies conducted in support of FERC and other Federal, state, and regional permit applications.
- Represented CMP before Maine Legislature's Environment and Natural Resources Committee, and Energy, Utilities and Technology Committee; developed and delivered expert testimony on wind energy and utility permitting, wastewater licensing, toxics use reduction, oil spill reporting, PCB's, stormwater management, wetlands, and wetlands mitigation legislation. Developed compliance plans when bills became laws.
- Develop comments and provide written and verbal response to regulators, regulatory boards, and legislators on various draft rules and legislation.
- Represented CMP on statewide linear projects vegetation management BMPs task force.
- Represent CMP on Maine State Chamber of Commerce Environmental and Energy Policy Committee.
- Testified before State Board of Environmental Protection regarding licensing of CMP's Hazardous Waste Storage facility and on numerous regulatory and rulemaking proposals.
- Represent CMP interests, pursue approvals, and clarify compliance requirements with federal, state, and local regulators.

Jose Gonzalo Moreno

Professional Profile

M. Sc. Electrical and Electronics Engineer with +14 years currently working as **Program Manager for High Voltage Direct Current (HVDC) projects**. Wide experience in Protection and Control Systems both in Transmission and Distribution power networks in Iberdrola, Scottish Power and AVANGRID Utilities (Spain, Scotland and USA, respectively) – all of them part of IBERDROLA Group. Involved in **IEC 61850** SAS implementations, **HVDC** projects (LCC and VSC technologies) and Protection and Control Systems **Standardization**. Member and contributor in different professional organizations: IEC, CIGRE and E3 Group. Currently a double MBA program student to be graduated in 2021.

Education

- **2019-2021 MBA Master in Business Administration in the Global Energy Industry:** Dual MBA program by the Comillas Pontifical University in Madrid, Spain; and University of Strathclyde in Glasgow, Scotland, United Kingdom.
- **1998-2003 Industrial Engineering Degree:** M. Sc. In Industrial Engineering (University of Seville, Spain). Specialty: Industrial Electric / Electronics Degree. Final Project: “Computational Solutions and Improvements in Electric Complex Networks”. (A+).

Current Position

2018 – Today Program Manager – NECEC HVDC Converter, AVANGRID, Rochester, NY. Program Manager for the first HVDC Converter Station to be built in AVANGRID, as part of the New England Clean Energy Connect (NECEC) Project, a 1200MW, 320kV HVDC Link between Quebec region in Canada and Lewiston area in Maine, US. Head of the team in charge of the US Converter Station package, responsible for the following tasks, among others:

- Responsible for the EPC Contract (including technical specifications) for the Converter Station (VSC).
- Responsible for the Converter Project Schedule, Budget and Scope.
- Responsible for discussions with Hydro-Quebec regarding alignment of the two Converter Stations, as they are responsible for the Canadian side part of the project.
- Responsible for the EPC Contract of +/- 600 MVars Dynamic Reactive Devices (DRDs) needed in Maine AC Power Network as part of the NECEC Project.

Experience

2017 – 2018 Manager - Protection and Control, AVANGRID, Rochester, NY. Manager of the Protection and Control (P&C) department (+ 40 internal engineers) for AVANGRID, which includes 4 different OpCos (Operating Companies): Rochester Gas & Electric (RGE) in NY; New York State Electric & Gas (NYSEG) in NY; Central Maine Power (CMP) in Maine and United Illuminating Company (UI) in CT. Some responsibilities included were:

- Responsible for all Intelligent Electronic Devices (IEDs) configuration files in service in AVANGRID Power Network at both transmission and distribution level.
- Responsible for NERC CIP and PRC compliance (P&C related) in AVANGRID
- Responsible for Event Analysis in the company and Transmission Network Model.



- Responsible for the definition of the standard P&C solution for AVANGRID

2016 – 2017 Principal Protection Engineer, AVANGRID, Rochester, NY. Specialized Protection and Control Engineer responsible for maintaining and developing Protection, Automation and Control Standards common to all OpCos in AVANGRID.

- P&C Standards Team Leader Responsible for managing the team in charge of developing a complete new set of P&C Standards for AVANGRID Utility (currently formed by 4 different Operating Companies), to be applicable to new projects.

2011 – 2016 Lead Protection and Control Engineer, IBERDROLA ENGINEERING & CONSTRUCTION (Glasgow, U.K.)

- First IEC 61850 pilot SAS (Windyhill 132 kV Switchgear Replacement Project) in an operating substation in Scottish Power Utility and the future massive roll out of 61850 SAS in the company, using a Multivendor IED solution.

Lead HVDC Protection and Control Engineer: Specialized Protection and Control Engineer for:

- Western HVDC Link project (joint venture between National Grid Electricity Transmission and Scottish Power Transmission) for the northern Converter Station, a 400 kV AC to 600 kV DC LCC Converter Station. Main tasks involved:
 - Lead Design Assurance Engineer: technical review and approval of P&C Design documentation
 - Type Registration approval of P&C solutions
 - P&C FATs / SATs witnessing and approval
 - P&C settings review and approval
- Eastern HVDC Link project (joint venture between National Grid, Scottish and Southern Energy and Scottish Power Transmission) for one of the converter stations.
- International Tenders: Evaluation of Technical Requirements and preparation of Protection and Control Technical Tenders for various international projects, including the following characteristics: SVC / LCC technology; Point-to-point / multi-terminal configurations; Onshore / Offshore HVDC Stations; HVDC Converter / Bussing Stations.

2009 – 2011 R&D Design Engineer for Smart Grid Projects, IBERDROLA INGENIERÍA Y CONSTRUCCIÓN (Madrid, SPAIN)

Iberdrola Group representative in:

- OpenNode project (FP7 research project for the European Commission) for Smart Grids development in Secondary Substations as Working Package #1 Leader.
- IEC 61850 Standardization: working on the development of the IEC 61850 Standard, representing Iberdrola in regular IEC meetings and developing IEC-61850 Iberdrola requirements for substations.

2005 – 2009 Protection & Control Engineer, IBERDROLA INGENIERÍA Y CONSTRUCCIÓN (Madrid, SPAIN). Worked on identification, protection architecture analysis and PC&M equipment requirements for both Transmission and Distribution level. Leader for protection, control and measurement systems in Substation projects; Network system design; studies and calculation of short circuit currents, power flows, protection performance, etc.; schedule, scope, and budget management; definition of protection, control and metering devices



for distribution substations; review of schematic diagrams; calculation of protection settings and protection coordination and on-site commissioning supervision.

2003 – 2005 Head of Protection and Control department, GLOBAL NETWORKING ENGINEERING S.L. (Barcelona, SPAIN). Responsible for the technical and commercial areas in the Protection and Control department.

2003 Energy Department Engineer, ISOTROL (Seville, SPAIN). Development of short circuit calculation algorithms.



Bernardo Escudero

Education

- **Master's Degree in Industrial Engineering**, ICAI (1996-2002). Energy, Electrical Engineering Comillas Pontifical University. Madrid (Spain)
- **Executive MBA in Global Energy Industry (2017-2019)** - *Iberdrola Cohort 3*. Strathclyde Business School, Glasgow (UK). Comillas Pontifical University. Madrid (Spain)

Certifications

- **Project Management Professional (PMP)**; Number 1670604, Project Management Institute.

Current Position

July 2017 – Present. Director, Business Development –AVANGRID Service Company-Networks, USA. Portland, ME.

Project lead for the development of Transmission Projects developed by AVANGRID in response to the New England Clean Energy goals and other transmission growth initiatives within the US. Lead Project Manager of the New England Clean Energy Connect (NECEC), \$950 million investment successfully awarded to AVANGRID in March 2018. Managed large multi-discipline teams made up of internal and external resources (more than 100 individuals) covering all aspects involved in project development and preparation for construction, including Engineering, Real Estate, Permitting, Cost & Schedule, Legal, Communications, etc.

February 2015 – June 2017. Manager, Project Development. Engineering Services – Special Projects. CENTRAL MAINE POWER (AVANGRID Networks). New Gloucester, ME (USA).

Project management of the development of Transmission Projects, including the Maine Renewable Energy Interconnect (MREI), Maine Clean Power Connection (MCPC) and other transmission initiatives developed by AVANGRID in response to the New England Clean Energy goals. Support to AVANGRID Business Development in current and future initiatives under Iberdrola's Strategic Plan for growth in the USA. Managed multi-discipline teams from other AVANGRID internal departments as well as external resources.

October 2011 – February 2015. Project Controls Manager, MPRP. IBERDROLA ENERGY PROJECTS. Networks Division. New Gloucester, ME (USA).

Project lead and main point of contact for Central Maine Power (CMP) in the delivery of the Control and Compliance Services for the Maine Power Reliability Program (MPRP). Assessment of the MPRP Program Management Team, proposing areas for adjustment and reporting to CMP on their progress. Report periodically to Iberdrola USA Steering Committee and provide annual updates at the Maine Public Utilities Commission (MPUC). Management of the IEP Team assigned to this effort (group of 4+ employees including Project Control Specialists and Permitting Analysts)



July 2019 – September 2011. Key Account Manager for Scottish Power Energy Networks. IBERDROLA ENGINEERING AND CONSTRUCTION UK. Networks Division. Glasgow (UK).

Key point of contact in IEC for SPEN. Management of contractual relationship. Coordination of IEC Networks Pipeline. IEC – Project Management and Engineering costs/income management. Schedule progress reporting. Team management (group of 10+ employees including Cost Controllers, Account Analysts and Program Controllers). **Implementation Manager of IEC UK Networks Division (through April 2010).** Lead of the creation of the IEC UK Networks Division. Benchmarking of delivery model with Scottish Power Energy Networks. Establishment of new delivery processes, Department Structures and cost/schedule methodology. Development and implementation of the SPEN/IEC Framework Agreement for the Engineering and Project Management Services provided to Scottish Power Energy Networks.

October 2008 – June 2009. Team Manager, Substations. Substations Department. IBERDROLA INGENIERIA Y CONSTRUCCIÓN. Madrid (Spain).

Manager of the team responsible for the engineering and project management of substation projects for Iberdrola Renovables in Spain. Technical lead and engineer of record. Team management (group of 15+ employees including Project Managers, Substation Engineers, Site Managers and Project Administrators). Engineering and construction management, project scheduling, project budgeting and contract management. Most notable projects commissioned within this period include: Sabina SS 132/20 kV, O Vieiro SS 132/20 kV, Medinaceli SS 400/132 kV, Páramo Vega SS 132/20 kV, Radona SS 132/20 kV, Aguaviva SS 132/30-20 kV.

September 2006 – September 2008. Project Manager, Substations. Substations Department. IBERDROLA ENGINEERING AND CONSTRUCTION, USA. Radnor, PA (USA)

Support to Iberdrola Renewables in their implementation in the US, coordinating the Transmission & Distribution area of Iberdrola Engineering. Responsible for its internal budget and the management of the contractual relationship between the parties.

Support to Iberdrola Renewables, USA: Technical Support and Owner Engineer for Locust Ridge SS 34,5/69 kV, Top of Iowa SS 34,5/115 kV, Jordanville SS 34,5/230 kV, Locust Ridge SS II 34,5/69 kV. Scheduling support, preliminary engineering development, technical assistance at meetings with electrical utilities, construction oversight. Development of substation detailed engineering and technical specifications for Providence Heights SS, including procurement management and technical support during construction. Development of work procedures, financial management, administrative management, adaptation of standard practices and procedures used in *Iberdrola Ingeniería y Construcción* to the US regulations.

January 2004 – September 2006. Project Engineer, Substations. Substations Department. IBERDROLA INGENIERIA Y CONSTRUCCIÓN. Madrid (Spain)

Project management of substation projects for Iberdrola Renovables in various parts of Spain, including direct involvement in substation and control & protection engineering and site supervision.

Project Management: Sil SS 220/20 kV extension, Chinchilla de Montearagón SS 66/20 kV, Larouco SS 132/20 kV extension.



Development of new Projects in Poland: Kisielice SS 110/30 kV, Koniecwald SS 110/30 kV. Attendance to meetings with Utilities and technical support to Iberdrola Renovables.

Civil and electrical engineering of the following substations: Maranchón I SS 132/20 kV, Maranchón IV SS 132/20 kV, Sierra de Dueñas SS 132/20 kV, Pedrosillo de los Aires SS 132 kV. *C&P engineering* of the following substation: Almansa SS 132/66 kV

March 2003 – December 2003. Projects Engineer, Solar Projects. Solar Energy Department. INSTALACIONES Y TÉCNICAS SOLARES, SL. Villafranca, Madrid (Spain)

Main Functions: Development, engineering and project/construction management of residential solar projects (PV and thermal).

Main Projects: Solar hot water and solar pool heating system in a single family house through thermal solar energy; 5 kV Photovoltaic generation plants connected to grid; Power supply through PV systems in isolated environments.

July 2001 – October 2002. Internship. Engineering Department. COLEGIO DE INGENIEROS DEL ICAI (ENGINEERING ASSOCIATION). Madrid (Spain)

QA/QC of high-speed railway projects (AVE Madrid-Valladolid). Preparation of ad-hoc reports and development of an internal engineering data base. Development of health and safety studies for various projects.

Attachment D
Evidence of NECEC LLC's title, right or interest (TRI) in NECEC

NECEC TRANSFER AGREEMENT

THIS NECEC TRANSFER AGREEMENT (the “Agreement”), dated as of _____, _____ (the “Contract Date”), is by and between **CENTRAL MAINE POWER COMPANY**, a Maine corporation (“CMP”) and **NECEC TRANSMISSION LLC**, a Delaware limited liability company (“Project Entity”).

RECITALS

A. CMP is developing a 1,200 MW +/- 320 kV HVDC transmission line extending from the U.S. border at Beattie Township, Maine to a new direct current to alternating current converter station to be located in Lewiston, Maine and a 345 kV alternating current transmission line between the converter station and CMP’s substation at Larrabee Road, Lewiston, Maine to provide transmission service pursuant to certain transmission service agreements all being collectively known as the New England Clean Energy Connect transmission project (the “NECEC”). The NECEC includes, without limitation, real estate interests, transmission service agreements, land use permits, regulatory approvals and vendor contracts.

B. On June 13, 2018, CMP entered into the following seven (7) transmission service agreements (each, as amended, a “TSA” and jointly the “TSAs”): Transmission Service Agreement between Central Maine Power Company and Fitchburg Gas and Electric Light Company d/b/a Unitil; Transmission Service Agreement between Central Maine Power Company and Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid; Transmission Service Agreement between Central Maine Power Company and Nstar Electric Company d/b/a Eversource Energy; Transmission Service Agreement (Unitil – 12.317 MW) between Central Maine Power Company and H.Q. Energy Services (U.S.) Inc.; Transmission Service Agreement (National Grid – 498.348 MW) between Central Maine Power Company and H.Q. Energy Services (U.S.) Inc.; Transmission Service Agreement (Eversource Energy – 579.335 MW) between Central Maine Power Company and H.Q. Energy Services (U.S.) Inc.; Additional Transmission Service Agreement between Central Maine Power Company and H.Q. Energy Services (U.S.) Inc. The TSAs were accepted for filing by the Federal Energy Regulatory Commission (“FERC”) on October 19, 2018.

C. In order to address certain questions raised in the Maine Public Utilities Commission Proceeding, Docket No. 2017-00232 regarding the NECEC, CMP desires to convey the NECEC to the Project Entity, and the Project Entity desires to acquire the NECEC from CMP, all on the terms and conditions set forth herein.

NOW, THEREFORE, in consideration of the Recitals and for other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the parties hereby agree as follows:

1. Conveyance of Real Estate Interests.

Subject to the terms and conditions of this Agreement, CMP agrees to convey, at the Closing, and the Project Entity agrees to accept, at the Closing, certain real estate interests sufficient to construct and operate a transmission line between Beattie Township, Maine and Lewiston, Maine together with land for the construction and operation of a converter station in Lewiston, Maine, together with real estate interests necessary to construct and operate a transmission line from the converter station to CMP's substation at Larrabee Road, Lewiston, Maine, and together with certain land acquired in connection with an eventual relocation of the Appalachian Trail in Bald Mountain Township T2 R3 BKP EKR, Somerset County, Maine (the "Real Estate Interests"). The Real Estate Interests consist of the following:

(a) A fee interest in an approximately 20-acre parcel of land in Lewiston, Maine (the "Converter Station Parcel"), which shall be conveyed by a deed substantially in the form attached hereto as Exhibit A (the "Deed");

(b) An easement for a transmission line from Beattie Township, Maine to Lewiston, Maine which shall be conveyed by an easement deed substantially in the form attached hereto as Exhibit B (the "Easement");

(c) A 100% grantee interest in a Transmission Corridor Easement between Bayroot LLC, as Grantor and CMP, as Grantee dated August 28, 2019 and recorded in the Franklin County Registry of Deeds in Book 4118, Page 37, as affected by an Agreement Affecting Transmission Corridor Easement between Bayroot, LLC and CMP dated August 28, 2019 (the "Merrill Strip Easement") which shall be assigned by an assignment substantially in the form attached hereto as Exhibit C ("Merrill Strip Easement Assignment");

(d) A 100% tenant's interest in a Transmission Line Lease between the State of Maine, Department of Agriculture, Conservation and Forestry, Bureau of Parks and Lands, as Lessor, and CMP, as Lessee, dated on or about June 15 and June 23, 2020 (the "State of Maine Lease") which shall be assigned by an assignment substantially in the form attached hereto as Exhibit D (the "State of Maine Lease Assignment");

(e) A fee interest in all of the real estate parcels that are ultimately approved by the Maine Department of Environmental Protection and the US Army Corps of Engineers as compensatory mitigation for environmental permits related to the NECEC (the "Compensation Land"). The Compensation Land will be restricted in perpetuity to offset impacts on wetlands and impacts on existing recreational uses as a result of the NECEC. A preliminary list of the Compensation Land is attached hereto as Exhibit E, it being agreed that such list is subject to change by the addition, removal, or substitution of parcels as the permitting process continues. The conveyance of the Compensation Land from CMP to the Project Entity will not materially affect the ability of CMP to perform its duties to the public. The Compensation Land shall be conveyed by one or more deeds substantially in the form of the Deed (the "Compensation Land Deeds");

(f) A fee interest in a real estate parcel described in Exhibit F acquired by CMP in connection with an eventual relocation of the Appalachian Trail in Bald Mountain Township T2 R3, Somerset County, Maine (the “AT Relocation Land”), which shall be conveyed a deed substantially in the form of the Deed (the “AT Relocation Land Deed”); and

(g) A fee interest in certain parcels of land in Lewiston, Maine near the Converter Station Parcel to create additional means of access to the Converter Station Parcel (the “Converter Station Access Land”), which shall be conveyed by one or more deeds substantially in the form of the Deed (“Converter Station Access Land Deeds”). A preliminary list of the Converter Access Land is attached hereto as Exhibit G, it being agreed that such list is subject to change by the addition of parcels.

In the event that additional real estate interests in non-operating property owned by CMP are required for the development or operation of the NECEC or there are properties acquired by CMP and recorded as part of NECEC’s development costs in FERC Account 107-Construction Work In Progress, CMP and the Project Entity agree to negotiate in good faith for CMP to convey real estate interests in said properties to the Project Entity and for the Project Entity to accept such real estate interests from CMP, whether in the form of a fee interest, an easement or otherwise, provided that the Project Entity shall compensate CMP for such real estate interests in accordance with CMP’s actual costs. Such deeds or easements between CMP and the Project Entity shall be substantially in the form of Exhibit A (Deed) or Exhibit B (Easement), respectively. If such additional conveyance of real estate interests occurs prior to or after the Closing, or any changes are made to the conveyances of real estate interests referenced above, CMP and the Project Entity will amend this Agreement to reflect such changes and will file the amended Agreement and exhibits with the Maine Public Utilities Commission on an informational basis.

2. Conveyance of Permits.

At the Closing, CMP shall assign to the Project Entity and the Project Entity shall assume all land use permits, any outstanding land use permit applications, and other regulatory permits (the “Permits”) related to the NECEC. The Permits include, but are not limited to, the following: A Site Law Certification from the Maine Land Use Planning Commission, a Site Location of Development Act permit from the Maine Department of Environmental Protection, a Water Quality Certification from the Maine Department of Environmental Protection, a Natural Resources Protection Act permit from the Maine Department of Environmental Protection, a Section 404 dredge and fill permit from the U.S. Army Corps of Engineers, a Presidential Permit from the U.S. Department of Energy, and various municipal permits and approvals from municipalities with jurisdiction over NECEC. It is anticipated that CMP shall be required to convey certain compensation real estate (other than the Compensation Land) to the State of Maine, or other qualified holders, as a condition of some of the Permits, and the value of such real estate is incorporated into this Agreement. A preliminary list of such compensation real estate is attached hereto as Exhibit H, it being agreed that such list is subject to change by the addition, removal, or substitution of parcels as the permitting process continues. To the extent CMP has not conveyed

such real estate to the State of Maine or other qualified holders prior to the transfer of the applicable Permits to the Project Entity, CMP shall also convey such real estate to the Project Entity for no additional consideration. The parties shall cooperate to effectuate the assignment of the Permits, including obtaining any required approvals for the assignment, and to obtain any Permits for which an application has been assigned by CMP to the Project Entity.

3. Conveyance of Transmission Services Agreements.

At the Closing, CMP shall assign to the Project Entity, and the Project Entity shall assume, the TSAs, as amended, including, without limitation, all of CMP's rights, interests and obligations under the TSAs. To the extent any approvals or third party consents are required for the assignment of the TSAs, either prior to or after the Closing, the parties shall cooperate to obtain such approvals or third party consents. In connection with the assignment of the TSAs, the Project Entity shall cause the amendment or replacement of the letters of credit provided on behalf of CMP under the TSAs.

4. Assignment of Third Party Vendor Agreements, Related Assets, and Miscellaneous Agreements.

(a) At the Closing, CMP shall assign to the Project Entity, and the Project Entity shall assume, the agreements executed by CMP with third party vendors and service providers in connection with the development and construction of the NECEC, including, but not limited to, those listed in Exhibit I-1 and any other such agreement executed by CMP between the Contract Date and the Closing ("Third Party Vendor Agreements"). As a result of such assignment, the Project Entity shall assume all of CMP's rights, interests and obligations under the Third Party Vendor Agreements.

(b) At the Closing, CMP shall assign or otherwise convey to the Project Entity, and the Project Entity shall assume and accept, such other tangible and intangible assets related to the NECEC that CMP may possess including, without limitation, designs, plans and other work product of CMP or vendors related to the NECEC, and intellectual property related to the NECEC (collectively, the "Related Assets").

(c) At the Closing, CMP shall assign or otherwise convey to the Project Entity, and the Project Entity shall assume and accept, certain miscellaneous NECEC Project Agreements as further described in Exhibit I-2 (collectively, the "Miscellaneous Agreements").

5. Consideration.

(a) (a) The consideration (the "Consideration") for the conveyance of the NECEC, including, without limitation, the Real Estate Interests, the Permits, the TSAs, the Third Party Vendor Agreements, the Related Assets, the Miscellaneous Agreements and any goodwill of CMP associated with the NECEC, is \$60,000,000.00 and shall be payable to CMP in

one hundred and sixty (160) equal quarterly installments of \$375,000 each, due on each Payment Date commencing on the first Payment Date following the Closing under this Agreement.

For the purposes of this Agreement (i) "Payment Date" means the first business day of each January, April, July and October following Permit Issuance, provided that the first Payment Date shall not occur prior to October 1, 2020 and that the total number of Payment Dates shall be one hundred and sixty (160), and (ii) "Permit Issuance" means the issuance the State of Maine and U.S. Army Corps of Engineers ("ACOE") permits required for the construction and operation of the NECEC, which are a Certificate of Public Convenience and Necessity from the Maine Public Utilities Commission, a Land Use Certification from the Maine Land Use Planning Commission, a Site Location of Development Act permit from the Maine Department of Environmental Protection, a Natural Resources Protection Act permit from the Maine Department of Environmental Protection, and a Section 404 dredge and fill permit from the US Army Corps of Engineers.

(b) Prior to the date the NECEC achieves commercial operation ("COD"), all of the Project Entity's payment obligations set forth in Section 5(a) shall be suspended immediately upon notice by the Project Entity to CMP, HQUS, the Governor's Energy Office, the Office of the Public Advocate, and the Industrial Energy Consumers Group, if any of the following conditions occur, and such suspension shall continue for as long as such condition continues to exist (and the term Payment Date shall be deemed to exclude any dates during such suspension that would otherwise constitute a Payment Date in order that the total number of Payment Dates remains as provided in Section 5(a)):

(i) Construction of a material part of the NECEC Transmission Line is suspended indefinitely or for an announced period of greater than 30 days, or

(ii) A legislative measure, including a citizens' initiative, has been adopted in the State of Maine challenging the validity of any Maine permit or seeking to hinder or block the construction of the NECEC Project and such legislative measure remains in effect as of the Payment Date(s).

(c) All of the Project Entity's accelerated payment obligations set forth in Section 5(a) shall terminate if the NECEC is terminated prior to COD.

6. Closing.

(a) The Closing shall take place at such time and place as shall be mutually agreed to by the Project Entity and CMP.

(b) The following shall occur at the Closing, each being a condition precedent to the others and all being considered as occurring simultaneously:

(i) CMP shall execute, have acknowledged and deliver to the Project Entity the Deed, the Easement, the Merrill Strip Easement Assignment, the State of Maine Lease Assignment, the Compensation Land Deeds, the AT Relocation Land Deed, the Converter Station Access Land Deeds;

(ii) CMP shall assign and the Project Entity shall assume the Permits;

(iii) CMP shall assign and the Project Entity shall assume the TSAs;

(iv) CMP shall assign and the Project Entity shall assume the Third Party Vendor Agreements;

(v) CMP shall assign and convey and the Project Entity shall assume and receive all Related Assets;

(vi) CMP shall assign and convey and the Project Entity shall assume the Miscellaneous Agreements;

(vii) CMP shall deliver an affidavit indicating that CMP is not a foreign person and that the transaction is exempt from the requirements of 26 U.S.C. §1445;

(viii) CMP shall deliver an affidavit indicating that CMP is a Maine resident;

(ix) Each party shall deliver to the other such other documents, certificates and the like as may be required herein or as may be necessary or helpful to carry out its obligations under this Agreement; and

(x) Each party shall deliver to the other necessary corporate or limited liability company evidence of authority (as the same may be applicable).

7. Survival of Obligations.

Any obligations herein that are not satisfied as of the Closing shall survive the Closing and this Agreement shall remain in full force and effect until all obligations herein are satisfied.

8. Service Agreement.

At the Closing, the parties shall enter into a service agreement, substantially in the form attached hereto as Exhibit J, whereby the Project Entity shall acquire services from CMP related to the development, construction and long-term operation of the NECEC.

9. Reserved Right to Sublease.

With respect to the State of Maine Lease, the parties agree that at any time during the term of either Lease, CMP may request that the Project Entity sublease one-half (1/2) of the width of either or both Leases to CMP for no consideration; provided, however, that each such sublease, shall require CMP to pay rent to the Project Entity equal to one-half (1/2) of the rent under the Lease for the term of the sublease. The parties shall cooperate to obtain all necessary permits and approvals for any such sublease requested by CMP.

10. Right of Way over Converter Station Access Road.

Promptly after the Project Entity acquires title to the Converter Station Access Land, the Project Entity and CMP shall enter into a reciprocal easement agreement, substantially in the form attached hereto as Exhibit K, whereby the Project Entity shall grant CMP an access easement over the Converter Station Access Land to access CMP's adjoining transmission corridor and CMP shall grant the Project Entity an access easement over its transmission corridor between the Converter Station Access Land and the Converter Station Parcel. There shall be no additional consideration for the reciprocal easement agreement.

11. Network Upgrades.

As part of the NECEC, upgrades to certain of CMP's existing transmission facilities will be necessary in order to permit the interconnection of the NECEC to the transmission system administered by ISO-NE in accordance with Section I.3.9 and the Capacity Capability Interconnection Standard of the ISO-NE Open Access Transmission Tariff (the "ISO-NE Tariff") (the "Network Upgrades"). CMP agrees to cooperate with the Project Entity to construct the Network Upgrades, provided that the Project Entity shall either pay for directly, or reimburse CMP, for the cost of the Network Upgrades in accordance with applicable ISO-NE Tariff provisions. Upon completion, the Network Upgrades shall remain the property of CMP.

12. Miscellaneous.

(a) The Parties shall cooperate to obtain any regulatory approvals or third party consents that may be required to effectuate the transaction contemplated by this Agreement.

(b) This Agreement shall inure to the benefit of and be binding upon the parties hereto and their respective successors in interest and permitted assigns.

(c) It is understood and agreed that all understandings, agreements, warranties or representations, either oral or in writing, including without limitation any letters of intent or prior agreements, heretofore between the parties hereto with respect to the subject matter of this Agreement are merged in and superseded by this Agreement, which document alone fully and completely expresses the parties' agreement with respect to the transactions covered hereby. The Project Entity acknowledges that it is not relying upon any statements or representations not

embodied in this Agreement. This Agreement may not be modified in any manner except by a subsequent instrument in writing signed by CMP and the Project Entity.

(d) This Agreement may be simultaneously executed in any number of counterparts, each of which when so executed and delivered shall be an original; but such counterparts shall constitute but one and the same instrument. This Agreement may be delivered electronically by pdf file.

(e) This Agreement shall be construed and enforced in accordance with and governed by the laws of the State of Maine.

(f) Each party represents and warrants that the execution of this Agreement, and the obligations created herein, have been authorized by all necessary and appropriate corporate or limited liability company approvals, as applicable.

[Signature Page Follows]

IN WITNESS THEREOF, the parties have executed this Agreement as a sealed instrument, to be effective as of the Contract Date.

CENTRAL MAINE POWER COMPANY,
a Maine corporation

By: _____
Name:
Its:

By: _____
Name:
Its:

NECEC TRANSMISSION LLC,
a Delaware limited liability company

By: _____
Name:
Its:

EXHIBIT A

Form of Deed

QUITCLAIM DEED WITH COVENANT

KNOW ALL BY THESE PRESENTS, that **CENTRAL MAINE POWER COMPANY**, a Maine corporation with a mailing address of 83 Edison Drive, Augusta, Maine 04330, for consideration paid, grants to **NECEC TRANSMISSION LLC**, a Delaware limited liability company, with a mailing address of _____, _____ County, _____, with QUITCLAIM COVENANT, certain lots or parcels of land and all improvements thereon, situated in Lewiston, Androscoggin County, Maine, being more particularly bounded and described as follows:

See **EXHIBIT A** attached hereto and made a part hereof.

IN WITNESS WHEREOF, Central Maine Power Company has caused this instrument to be executed by _____, its _____, and _____, its _____, effective as of this _____ day of _____, ____.

[SIGNATURE PAGES TO FOLLOW]

4427

CENTRAL MAINE POWER COMPANY,
a Maine corporation

By: _____
Name:
Its:

State of _____
County of _____

On _____, _____ personally appeared the above-named
_____ (Name), _____ (Title) of Central Maine Power Company, a
Maine corporation, and acknowledged the foregoing instrument to be his/her free act and deed
in his/her said capacity and the free act and deed of said corporation.

Before me,

Notary Public/Maine Attorney at Law
Printed Name
My Commission expires: _____

CENTRAL MAINE POWER COMPANY,
a Maine corporation

By: _____
Name:
Its:

State of _____
County of _____

On _____, _____ personally appeared the above-named
_____ (Name), _____ (Title) of Central Maine Power Company, a
Maine corporation, and acknowledged the foregoing instrument to be his/her free act and deed
in his/her said capacity and the free act and deed of said corporation.

Before me,

Notary Public/Maine Attorney at Law
Printed Name
My Commission expires: _____

EXHIBIT A

Two certain lot or parcel of land situated northerly of, but not abutting to, Merrill Road, in the City of Lewiston, county of Androscoggin, and State of Maine, bounded and described as follows to wit:

Small Triangle

Beginning on the southwesterly municipal boundary by and between The City of Lewiston and the Town of Greene at a point located on the easterly line of land of Central Maine Power Company, reference is to be made to a deed of merger dated December 23, 2005 and recorded in the Androscoggin County Registry of Deeds in Book 3761, Page 304 and to a deed dated November 5, 1930 and recorded in the Androscoggin County Registry of Deeds in Book 408, Page 280, being the southwesterly line of land conveyed to George P. Schott by a deed dated April 12, 1996 and recorded in the Androscoggin County Registry of Deeds in Book 3580, Page 349;

Thence, southeasterly on a course of S 55°-08'-27" E along southwesterly municipal boundary, being the southwesterly line of land of Schott a distance of thirty-two and forty-four hundredths (32.44) feet to a point located on the northwesterly corner of LOT 79 of the City of Lewiston;

Thence, southwesterly on a course of S 38°-00'-54" W along the northwesterly line of LOT 79 a distance of one hundred twenty-two and forty-one hundredths (122.41) feet to a point located on the easterly line of land of Central Maine Power Company (408/280);

Thence, northerly on a course of N 22°-59'-06" E along the easterly line of land of Central Maine Power Company a distance of one hundred twenty-four and ninety (124.90) feet to the point and place of beginning. Containing 1,982.40 square feet (0.046 acres).

Bearings are based on a GPS Observation of Grid North.

20.010 Acre Parcel

Beginning on the southwesterly municipal boundary by and between The City of Lewiston and the Town of Greene at a point located at the northwesterly corner of land conveyed to _____ by a deed dated July 26, 1984 and recorded in the Androscoggin County Registry of Deeds in Book 1745, Page 003;

Thence, southwesterly on a course of S 36°-46'-19" W along the southwesterly line of land of Perron a distance of nine hundred seventy-six and zero hundredths (976.00) feet to a point;

Thence, northwesterly on a course of N 59°-26'-38" W through land conveyed to _____ by a deed dated September 23, 1987 and recorded in the Androscoggin County Registry of Deeds in Book 2159, Page 240, a distance of seven hundred forty-five and forty hundredths (745.40) feet to a point located on the easterly line of land of Central Maine Power Company, reference is to be made to a deed of merger dated December 23, 2005 and recorded in the Androscoggin County Registry of Deeds in Book 3761, Page 304 and to a deed

dated November 14, 1930 and recorded in the Androscoggin County Registry of Deeds in Book 407, Page 526;

Thence, northerly on a course of N 22°-59'-06" E along the easterly line of land of Central Maine Power Company a distance of nine twenty-nine and four hundredths (929.04) feet to a point located on the northwesterly line of LOT 79 of the City of Lewiston;

Thence, northeasterly on a course of N 38°-00'-54" E along the northwesterly line of LOT 79 a distance of one hundred twenty-two and forty-one hundredths (122.41) feet to a point located on the southwesterly municipal boundary by and between The City of Lewiston and the Town of Greene;

Thence, southeasterly on a course of S 55°-08'-27" E along southwesterly municipal boundary, being the southwesterly line of land of Schott a distance of nine hundred sixty and twenty-nine hundredths (960.29) feet to the point and place of beginning. Containing 20.01 acres of land, more or less.

Bearings are based on a GPS Observation of Grid North.

Central Maine Power Company acquired its title to the above described Small Triangle and 20.010 Acre Parcel in a deed from _____ dated April 9, 2018 and recorded in the Androscoggin Registry of Deeds in Book 9817, Page 72. This conveyance is for the entirety of the land acquired in said deed.

EXHIBIT B

Form of Easement

TRANSMISSION LINES EASEMENT DEED

WHEREAS CENTRAL MAINE POWER COMPANY, a Maine corporation with a place of business at 83 Edison Drive, Augusta, Maine 04366 (hereinafter referred to as "**CMP**", which word is intended to include, unless expressly stated otherwise, CMP and its successors and assigns), owns, in part as fee and in part as easement, certain lands located in the City of Lewiston and Towns of Greene, Leeds and Livermore Falls, all in Androscoggin County, Maine; Jay, Chester, Wilton, Farmington and Industry, all in Franklin County, Maine; Starks, Anson, Embden, Concord, Moscow, Caratunk, Bald Mountain (T2R3 BKP EKR), The Forks Plantation, Moxie Gore (T1R5 BKP EKR), West Forks Plantation, Johnson Mountain (T2R6 BKP WKR), Parlin Pond (T3R7 BKP WKR), Bradstreet (T4R7 BKP WKR), Hobbstown (T4R6 BKP WKR), Raytown (T5R7 BKP WKR) and Appleton (T6R7 BKP WKR), all in Somerset County, Maine; and Skinner (T1R7 WBKP), Lowelltown (T1R8 WBKP) and Beattie (T2R8 WBKP), all in Franklin County, Maine, hereinafter, the "**CMP LAND**", included in the lands acquired pursuant to the instruments listed on **SCHEDULE 1, CMP DEEDS**, attached and made a part hereof (the "**CMP DEEDS**");

WHEREAS NECEC TRANSMISSION LLC, a Delaware limited liability company with a place of business at One City Center, 5th floor, Portland, Maine 04101 (hereinafter referred to as "**NECEC Transmission**", which word is intended to include, unless expressly stated otherwise, NECEC Transmission and its successors and assigns), desires to erect, construct, maintain, repair, rebuild, respace, replace, operate, patrol and remove a single overhead direct current electric line and a three-phase electric line over and across the CMP Land, consisting of (i) a 320kV line (the "SECTION 432 TRANSMISSION LINE") extending from the border of the Providence of Quebec in Beattie Township, Franklin County to NECEC Transmission's new Converter Site in Lewiston, Androscoggin County (hereinafter referred to as the "**CONVERTER SITE**"), and (ii) a 345kV line (the "SECTION 3007 TRANSMISSION LINE") extending southerly from said Converter Site to CMP's Larrabee Road Substation located in Lewiston, Androscoggin County, Maine, each line consisting of suitable and sufficient poles, cables, and towers with sufficient foundations together with lines extending upon, within and between the same for the transmission of electric energy and intelligence related thereto, together with any fixtures, anchors, guys, crossarms, and other equipment and appurtenances (as so consisting hereinafter referred to respectively as the "**SECTION 432 TRANSMISSION LINE**" and the "**SECTION 3007 TRANSMISSION LINE**", and together as the "**NECEC TRANSMISSION LINE**"). The NECEC Transmission Line may be constructed as an underground line in certain areas. The NECEC Transmission Line will be located on or partly on a portion of the CMP Land, and;

WHEREAS at NECEC Transmission's option NECEC Transmission and CMP will enter into an unrecorded Use Agreement providing operational guidance to both Parties, as defined below, in connection with construction upon and ongoing maintenance and use of the easements and rights conveyed and reserved herein, a copy of which shall be kept on file at the offices of both CMP and NECEC Transmission (the "**USE AGREEMENT**").

NOW THEREFORE, CMP grants and assigns to NECEC Transmission the easements, rights, privileges, and consents more particularly described in **EXHIBIT A**, attached hereto and

made a part hereof.

EXCEPTING AND RESERVING to CMP, its successors and assigns, all rights and easements not conveyed hereunder, including without limitation the easements and rights more particularly described in EXHIBIT B attached hereto and made a part hereof.

This conveyance is made **SUBJECT TO** certain easements, licenses and agreements more particularly described in EXHIBIT C attached hereto and made a part hereof.

Also, this conveyance and the rights reserved hereunder are made **SUBJECT TO AND TOGETHER WITH** the covenants, terms and conditions set forth in EXHIBIT D, attached and made a part hereof.

CMP and NECEC Transmission shall hereinafter be referred, individually, as a "PARTY" and collectively, as the "PARTIES".

SUCCESSORS AND ASSIGNEES

NECEC Transmission may assign its interests in and rights under this Easement Deed, but such assignment shall be conditioned upon express assignment to any assignee of all of NECEC Transmission's obligations under this Easement Deed and the Use Agreement relating to the interests and rights assigned, and upon written acceptance and assumption of all such obligations by any such assignee. This Easement Deed and all the provisions hereof inure to the benefit of and are binding upon the Parties and the respective successors and permitted assignees of CMP and NECEC Transmission.

IN WITNESS WHEREOF, Central Maine Power Company has caused this instrument to be signed in its corporate name and sealed with its corporate seal by _____, _____, and _____, hereunto duly authorized, this _____ day of _____, _____.

(Signature pages follow)

4434

Witness:

CENTRAL MAINE POWER COMPANY

State of Maine

_____ County, Maine

_____, _____

Personally appeared the above-named _____, _____,
Central Maine Power Company and acknowledged the foregoing instrument to be his free act in
his said capacity and the free act and deed of said corporation.

Before me,

Notary Public

My commission expires:

State of Maine

_____ County, Maine

_____, _____

Personally appeared the above-named _____, _____,
Central Maine Power Company and acknowledged the foregoing instrument to be his free act in
his said capacity and the free act and deed of said corporation.

Before me,

Notary Public

My commission expires:

GRANTEE'S ACCEPTANCE:

NECEC Transmission LLC hereby covenants and agrees to the terms and obligations set forth in this Easement Deed and has caused this acceptance to be signed by _____, _____, hereunto duly authorized, this ____ day of _____, _____.

Witness:

NECEC TRANSMISSION LLC

State of Maine

_____ County, Maine

_____, _____

Personally appeared the above-named _____, _____, NECEC Transmission LLC, and acknowledged the foregoing to be his free act and deed in said capacity and the free act and deed of said company.

Before me,

Notary Public

My commission expires:

EXHIBIT A**EASEMENTS****EASEMENT ONE: SECTION 432 TRANSMISSION LINE EASEMENT**

The perpetual right, easement and consent to erect, construct, maintain, repair, rebuild, respace, replace, operate, patrol and remove the Section 432 Transmission Line for the transmission of electric energy and intelligence related thereto, as well as fiber optic cables and other communication systems (all of the foregoing hereinafter collectively referred to as the "SECTION 432 TRANSMISSION LINE EASEMENT"), over, across and under portions of the CMP Land as follows:

Except as provided below, a 150 foot wide strip of land being 75 feet on either side of a centerline beginning at a point northerly, but not adjacent to Merrill Road in the City of Lewiston, Androscoggin County, Maine and extending northerly, northeasterly, northerly and westerly through the towns of Lewiston, Greene, Leeds and Livermore Falls, all in Androscoggin County, Maine; Jay, Chester, Wilton, Farmington and Industry, all in Franklin County, Maine; Starks, Anson, Embden, Concord, Moscow, Caratunk, Bald Mountain (T2R3 BKP EKR), The Forks Plantation, Moxie Gore (T1R5 BKP EKR), West Forks Plantation, Johnson Mountain (T2R6 BKP WKR), Parlin Pond (T3R7 BKP WKR), Bradstreet (T4R7 BKP WKR), Hobbstown (T4R6 BKP WKR), Raytown (T5R7 BKP WKR) and Appleton (T6R7 BKP WKR), all in Somerset County, Maine; and Skinner (T1R7 WBKP), Lowelltown (T1R8 WBKP) and Beattie (T2R8 WBKP), all in Franklin County, Maine, and terminating on the border between the State of Maine and the Province of Quebec in the aforementioned town of Beattie (T2R8 WBKP), the ("SECTION 432 TRANSMISSION LINE CENTERLINE"). The Section 432 Transmission Line Centerline description is attached hereto and made a part hereof as **SCHEDULE 2, SECTION 432 TRANSMISSION LINE CENTERLINE DESCRIPTION**. The areas where the Section 432 Transmission Line Easement will not be 150 feet wide are as follows:

KENNEBEC RIVER CROSSING AREA – The Kennebec River Crossing Area is that portion of the CMP Land located on the west and east sides of the Kennebec River in West Forks Plantation and Moxie Gore (T1R5 BKP EKR), Somerset County, Maine as shown on the plan titled "Central Maine Power Company, Kennebec River Crossing Area" dated _____ and recorded in the Somerset County Registry of Deeds in Plan Book _____ (the "KENNEBEC RIVER CROSSING AREA"). The limits of the Section 432 Transmission Line Easement in the Kennebec River Crossing Area are as shown on said plan.

Further, within the Section 432 Transmission Line Centerline, the following areas will be subject to Reservation Three – Substation Reservation as defined in Exhibit B, below:

STARKS SUBSTATION AREA – The Starks Substation Area is that portion of the CMP Land located westerly of Route 43 in the town of Starks, Somerset County, Maine as shown on the plan titled "Central Maine Power Company, Starks Substation Area" dated _____ and recorded in the Somerset County Registry of Deeds in Plan Book _____ (The "STARKS

SUBSTATION AREA"). The limits of the Section 432 Transmission Line Easement in the Starks Substation Area are as shown on said plan.

STURTEVANT SUBSTATION AREA – The Sturtevant Substation Area is that portion of the CMP Land located northerly of Route 2 in the town of Farmington, Franklin County, Maine as shown on the plan titled "Central Maine Power Company, Sturtevant Substation Area" dated _____ and recorded in the Franklin County Registry of Deeds in Plan Book _____ (The "STURTEVANT SUBSTATION AREA"). The limits of the Section 432 Transmission Line Easement in the Sturtevant Substation Area are as shown on said plan.

LIVERMORE FALLS SUBSTATION AREA – The Livermore Falls Substation Area is that portion of the CMP Land located southerly of Moose Hill Road in the town of Livermore Falls, Androscoggin County, Maine as shown on the plan titled "Central Maine Power Company, Livermore Falls Substation Area" dated _____ and recorded in the Androscoggin County Registry of Deeds in Plan Book _____ (The "LIVERMORE FALLS SUBSTATION AREA"). The limits of the Section 432 Transmission Line Easement in the Livermore Falls Substation Area are as shown on said plan.

Said 150-foot-wide easement area and the easement areas within the Kennebec River Crossing Area, the Starks Substation Area, the Sturtevant Substation Area, and the Livermore Falls Substation Area being hereinafter referred to as the "SECTION 432 TRANSMISSION LINE EASEMENT AREA."

NECEC Transmission covenants and agrees with CMP that other than the Section 432 Transmission Line, and all lines, poles and towers related thereto, NECEC Transmission will not erect or permit the erection of additional lines of poles or towers, together with lines extending upon, within and between the same, within the Section 432 Transmission Line Easement Area and that any replacements of the Section 432 Transmission Lines shall be on centerlines and in the locations as described above.

EASEMENT TWO: SECTION 3007 TRANSMISSION LINE EASEMENT

The perpetual right, easement and consent to erect, construct, maintain, repair, rebuild, respace, replace, operate, patrol and remove the Section 3007 Transmission Line for the transmission of electric energy and intelligence related thereto, as well as fiber optic cables and other communication systems (all of the foregoing hereinafter collectively referred to as the "SECTION 3007 TRANSMISSION LINE EASEMENT"), over, across and under portions of the CMP Land located between the Orrington Substation and the Section 203 Transition Area and two parcels within said Section 203 Transition Area, all as follows:

Except as provided below, a 150-foot-wide strip of land being 75 feet on either side of a centerline beginning at a point on north of Merrill Road in Lewiston, Androscoggin County, Maine and extending southerly to a termination point at Larrabee Road Substation, also in said Lewiston (the "SECTION 3007 TRANSMISSION LINE CENTERLINE"). The description of the Section 3007 Transmission Line Centerline is shown on **SCHEDULE 3, SECTION 3007 TRANSMISSION LINE CENTERLINE DESCRIPTION**, attached hereto and made a part hereof. The areas where the

Section 3007 Transmission Line Easement will not be located as described above are as follows:

LARRABEE ROAD SUBSTATION AREA – The Larrabee Road Substation Area is that portion of the CMP Land located southerly of Merrill Road in the City of Lewiston, Androscoggin County, Maine as shown on the plan titled “Central Maine Power Company, Larrabee Road Substation Area” dated _____ and recorded in the Androscoggin County Registry of Deeds in Plan Book _____ (The “LARRABEE ROAD SUBSTATION AREA”). The limits of the Section 3007 Transmission Line Easement in the Larrabee Road Substation Area are as shown on said plan.

Said 150-foot-wide easement area and the easement areas within the Larrabee Road Substation Area being hereinafter referred to as the "SECTION 3007 TRANSMISSION LINE EASEMENT AREA."

NECEC Transmission covenants and agrees with CMP that other than the Section 3007 Transmission Line, and all lines, poles and towers related thereto, NECEC Transmission will not erect or permit the erection of additional lines of poles or towers, together with lines extending upon, within and between the same, within the Section 3007 Transmission Line Easement Area and that any replacements of the Section 3007 Transmission Line shall be on centerlines and in the locations as described above.

The Section 432 Transmission Line Easement and the Section 3007 Transmission Line Easement are referred to jointly as the "NECEC TRANSMISSION LINE EASEMENT", and the Section 432 Transmission Line Easement Area and the Section 3007 Transmission Line Easement Area are referred to jointly as the "NECEC TRANSMISSION LINE EASEMENT AREAS".

The NECEC Transmission Line Easement shall include the following rights with respect to the Section 432 Transmission Line and the Section 3007 Transmission Line:

1. The right to enter upon the NECEC Transmission Line Easement Areas at any time with workers and all necessary tools and machinery to dig holes, to erect, construct, reconstruct, replace, remove, maintain, operate, repair, rebuild, upgrade, and use poles, towers, foundations, guy wires, communication equipment, and apparatus used or useful for the transmission of electricity and intelligence, together with their strengthening supports, sufficient foundations and supports, all as NECEC Transmission, its successors and assignees, may from time to time reasonably require in connection with the operation and maintenance of its transmission lines;
2. The right to construct such roads within the NECEC Transmission Line Easement Areas as NECEC Transmission may from time to time reasonably require to provide access for such workers, tools or machinery;
3. The right to transmit electricity, intelligence and communications over said wires, cables or apparatus for lawful purposes;
4. The right to erect and maintain signage, gates, fences and other barriers as reasonably

necessary to restrict recreational vehicles or other public access in the NECEC Transmission Line Easement Areas; and

5. The right to establish certain safety regulations for the NECEC Transmission Line Easement Areas that are necessary and proper for the operation of the rights herein granted and for the transmission of electricity (the "Safety Regulations"), which Safety Regulations shall be based upon the National Electric Safety Code, applicable Occupational Safety and Health Administration (OSHA) standards for worker safety and health, NECEC Transmission's company work standards and practices for safety and health, the standards governing operational reliability of the North American Energy Reliability Council (NERC), the Federal Energy Regulatory Commission (FERC) regulations and standards, the Independent System Operator -New England (ISO-NE) rules and standards, and/or any similar national, regional or state standards, and otherwise subject to normal and customary utility standards and practices.

EASEMENT THREE: ACCESS EASEMENT

The non-exclusive right and easement, in common with CMP and others; for access by foot and vehicle (hereinafter, the "ACCESS EASEMENT") along and across the CMP Land and such land as CMP may acquire in the future which adjoins the NECEC Transmission Line Easement Areas for the sole purpose of access to the NECEC Transmission Line Easement Areas.

Together with the non-exclusive right and easement, to the extent CMP may assign such rights, to use existing and future easements obtained over lands of others for the purpose of accessing CMP Land on which the NECEC Transmission Line Easement is located.

EASEMENT FOUR: VEGETATION MANAGEMENT EASEMENT

NECEC TRANSMISSION LINE EASEMENT AREAS - The perpetual right and easement, in common with CMP, but not the obligation, to clear and keep clear the NECEC Transmission Line Easement Areas of trees, brush and other vegetation by any lawful means. The exercise of such rights shall be at NECEC Transmission's sole cost unless otherwise agreed to in the Use Agreement.

OTHER AREAS; DANGER TREES - NECEC shall also have the right to enter upon CMP Land and to remove all woody vegetation located on CMP Land capable of growing into or falling into the minimum conductor safety zone around NECEC Transmission's transmission conductors. CMP intends this easement to allow for the removal of danger trees or hazard trees as defined herein that are within or outside the NECEC Transmission Line Easement Area. For the purposes of this easement, the following definitions apply: A "danger tree" is defined as a tree that if it failed could contact the conductors. A "hazard tree" means any tree that is structurally unsound that could strike a conductor upon failure; examples include dead trees, unsightly trees after pruning, unhealthy trees, trees with weakened crotches, trees leaning over or towards the wires, or species known to have a high failure rate; and to exercise similar rights, in common with CMP, that CMP may have,

including without limitation pursuant to the CMP Deeds, or may acquire with respect to lands of third parties.

EASEMENT FIVE: GUYING RIGHTS

The right to place, replace, relocate, repair or remove guys, guy anchors and cables (collectively "Guys") in the CMP Land, or such land as CMP may acquire in the future, located within 35 feet of the limits of the NECEC Transmission Line Easement Area, except at Structure 2, Section 432, where the distance shall be 45 feet, provided, however, such placement of Guys does not interfere with CMP's existing or future transmission lines. If Guys placed outside of the NECEC Transmission Line Easement Area do interfere with CMP's existing or future transmission lines, NECEC shall, upon written notice from CMP, and at the sole cost of NECEC Transmission, relocate such Guys or redesign the appurtenant structure so as not to interfere with CMP's existing or future transmission lines.

NECEC'S RIGHT TO RELOCATE CMP'S TRANSMISSION LINES

PARALLEL LINES – In the event that NECEC Transmission is required to relocate any portion of the Section 432 Transmission Line Centerline or the Section 3007 Transmission Line Centerline, except in the Starks Substation Area, the Sturtevant Substation Area, the Livermore Falls Substation Area and the Larrabee Road Substation Area and those crossing locations described in Schedule 4, as described in Exhibit B, below, to a point closer than 75 feet, as measured perpendicularly, from the centerline of any existing or future CMP transmission line (the "CMP Line", whether one or more transmission lines), NECEC Transmission shall have the right to require CMP to relocate from time to time any portion of the CMP Line that must be relocated to maintain said separations, provided that if NECEC Transmission makes any relocation of either the Section 432 Transmission Line or the Section 3007 Transmission Line, NECEC Transmission shall be required to maintain at least a 75-foot separation, measured perpendicularly, between the centerline of the relocated CMP Line and the centerline of the relocated Section 432 Transmission Line and/or the Section 3007 Transmission Line, with all costs related to such relocation (including, without limitation, any costs of any additional land or easement rights necessitated by such relocation, but expressly excluding any costs related to the interruption of transmission of electricity) to be paid at NECEC Transmission's sole cost and expense. Any such relocation may be required only after (a) at least 90 days prior written notice to CMP, which notice shall include detailed plans for CMP's review, and (b) any additional land or easement rights, permits or approvals necessitated by such relocation of either the Section 432 Transmission Line or the Section 3007 Transmission Line have been obtained by NECEC Transmission and delivered to CMP, to CMP's reasonable satisfaction. Any such relocation shall be undertaken by CMP only at such time as will minimize the disruption of CMP's use of the CMP Line. The relocation of the CMP Line, as proposed by NECEC Transmission hereunder, shall not materially impair the rights of CMP reserved herein and shall not materially impair the utility of the rights of CMP existing at the time of said relocation, as reasonably determined by CMP.

SUBSTATIONS – Within the Starks Substation Area, the Sturtevant Substation Area, the Livermore Falls Substation Area and the Larrabee Road Substation Area NECEC Transmission

shall not have the right to relocate the CMP Line or CMP facilities.

CROSSING LINES – Within the locations listed in said Schedule 4, NECEC Transmission shall have the right to require CMP to relocate or modify from time to time any portion of the CMP Line that must be relocated or modified to maintain the then current separation standard between the NECEC Transmission Line and the CMP Line, with all costs related to such relocation (including, without limitation, any costs of any additional land or easement rights necessitated by such relocation, but expressly excluding any costs related to the interruption of transmission of electricity) to be paid at NECEC Transmission's sole cost and expense. Any such relocation may be required only after (a) at least 90 days prior written notice to CMP, which notice shall include detailed plans for CMP's review, and (b) any additional land or easement rights, permits or approvals necessitated by such relocation of either the Section 432 Transmission Line or the Section 3007 Transmission Line have been obtained by NECEC Transmission and delivered to CMP, to CMP's reasonable satisfaction. Any such relocation shall be undertaken by CMP only at such time as will minimize the disruption of CMP's use of the CMP Line. The relocation of the CMP Line, as proposed by NECEC Transmission hereunder, shall not materially impair the rights of CMP reserved herein and shall not materially impair the utility of the rights of CMP existing at the time of said relocation, as reasonably determined by CMP.

EXHIBIT B**CMP'S RESERVATIONS**

The following perpetual rights and easements:

RESERVATION ONE (in the NECEC TRANSMISSION LINE EASEMENT AREAS)

1. The right to erect, construct, maintain, repair, rebuild, respace, replace, operate, patrol and remove the CMP Line and other improvements, transmission and communication lines, apparatus and equipment as such currently exist or may exist in the future.
2. The right to use the NECEC Transmission Line Easement Areas for access by foot and vehicle to the CMP Line and to CMP Land and to grant third parties the right to travel upon, across and through the NECEC Transmission Line Easement Areas by foot and vehicle.
3. The right to use and maintain all currently existing roads and those that may be subsequently built, that run along and cross the NECEC Transmission Line Easement Areas; and
4. The right to cross the Section 432 Transmission Line and the Section 3007 Transmission Line with transmission, distribution and communication lines in those locations described in **SCHEDULE 4, EXISTING CMP LINE CROSSING LOCATIONS**, attached hereto and made a part hereof.
5. The right to cross the Section 432 Transmission Line and the Section 3007 Transmission Line with future transmission, distribution and communication lines provided such crossing does not unreasonably impair NECEC Transmission's use of the NECEC Transmission Line Easement Areas. Upon completion of such future crossing, CMP will record in the appropriate County Registry of Deeds an amended Schedule 4, Existing CMP Line Crossing Location describing the new crossing location.
6. The right to erect and maintain signage, gates, fences, and other barriers as are reasonably necessary to restrict recreational vehicles or other public access from, in or to CMP Land.
7. The right to use the NECEC Transmission Line Easement Areas for any purpose, or to grant easements or leases in favor of third persons for any lawful purpose permitted under applicable laws, so long as any such uses, easements or leases do not unreasonably interfere with the exercise by NECEC Transmission of any of its rights granted pursuant to this Easement Deed and the Use Agreement. Any proposed easement or lease for all or any portion of the NECEC Transmission Line Easement Areas for electric use shall be subject to NECEC Transmission's prior written approval, which approval shall not be unreasonably withheld, conditioned or delayed.
8. Any other rights currently of CMP or as may be acquired by CMP in the future, provided the exercise of such rights does not materially impair the rights granted to NECEC Transmission herein.

RESERVATION TWO – GUY EASEMENT

The right to place, replace, relocate, repair or remove guys, guy anchors and cables in the NECEC Transmission Line Easement Areas, provided such placement does not unreasonably impair the use of the NECEC Transmission Line Easement Areas by NECEC Transmission.

RESERVATION THREE – SUBSTATION RESERVATION

The right to operate, maintain, repair or replace the existing Livermore Falls Substation, Sturtevant Substation, Starks Substation and Larrabee Road Substation (collectively, the “Reserved Substations”) to the extent the same are located within the NECEC Transmission Line Easement Area and shown on their respective plans.

RESERVATION FOUR – KENNEBEC RIVER CROSSING AREA

The right to construct, operate, maintain, repair and replace transmission, distribution and communication lines within the Kennebec River Crossing Area provided such use does not materially impair the construction, operation, maintenance, repair or replacement of the NECEC Transmission Line. Upon review and approval by NECEC Transmission of CMP’s plans for such CMP Line, said approval not to be unreasonably withheld or delayed, NECEC Transmission will enter into such agreements as necessary to facilitate the permitting of such new CMP Line and will modify the easement area of the Kennebec River Crossing Area as necessary to accommodate the new CMP Line.

RESERVATION FIVE – RIGHT TO CONVEY

Without limiting the generality of the foregoing, CMP specifically reserves the right to grant, assign, dispose of or otherwise convey, any of its remaining rights or interests in and to the CMP Land, subject to the terms and conditions of this Easement Deed and the Use Agreement, including without limitation all rights and property interests acquired pursuant to the CMP Deeds as set forth in Schedule 1 attached hereto and made a part hereof, and to receive all of the proceeds from the same; provided, however that the conveyance of any such rights or interests shall not unreasonably interfere with the exercise by NECEC Transmission of any of its rights granted pursuant to this Easement Deed and the Use Agreement, and provided further, to the extent applicable, that such conveyance shall be conditioned upon express assignment to any assignee of CMP's obligations under this Easement Deed and the Use Agreement relating to the interest and rights conveyed and upon written acceptance of all such obligations by any such assignee.

CMP'S RIGHT TO RELOCATE THE NECEC TRANSMISSION LINE

PARALLEL LINES – In the event that CMP elects to relocate any portion of a CMP Line to a location that causes the centerline of the CMP Line to be closer than 75 feet, as measured perpendicularly, from the centerline of the NECEC Transmission Line, CMP shall have the right to require NECEC Transmission to relocate from time to time any portion of the NECEC

Transmission Line that must be relocated to maintain said separations, provided that (i) if CMP makes any relocation of a CMP Line, CMP shall be required to maintain at least a 75-foot separation, measured perpendicularly, between the centerline of the relocated CMP Line and the centerline of the relocated NECEC Transmission Line; (ii) if the relocation of the NECEC Transmission Line causes the centerline of the NECEC Transmission line to have a separation of less than 75-feet, as measured perpendicularly, from another CMP Line, CMP will relocate such other CMP Line so as to maintain said 75-foot separation, with all costs related to such relocation (including, without limitation, any costs of any additional land or easement rights necessitated by such relocation, but expressly excluding any costs related to the interruption of transmission of electricity) to be paid at CMP's sole cost and expense. Any such relocation may be required only after (a) at least 90 days prior written notice to NECEC Transmission, which notice shall include detailed plans for NECEC Transmission's review, and (b) any additional land or easement rights, permits or approvals necessitated by such relocation of the CMP Line have been obtained by CMP and delivered to NECEC Transmission, to NECEC Transmission's reasonable satisfaction. Any such relocation shall be undertaken by NECEC Transmission only at such time as will minimize the disruption of NECEC Transmission's use of the NECEC Transmission Line. The relocation of the NECEC Transmission Line, as proposed by CMP hereunder, shall not unreasonably interfere with the rights of NECEC Transmission granted herein and shall not unreasonably interfere with the utility of the rights of NECEC Transmission existing at the time of said relocation, as reasonably determined by NECEC Transmission.

CROSSING LINES – Within the locations listed in said Schedule 4, CMP shall have the right to require NECEC Transmission to relocate or modify from time to time any portion of the NECEC Transmission Line that must be relocated or modified to maintain the then current separation standard between the CMP Line (whether new, modified or relocated) and the NECEC Transmission Line, with all costs related to such relocation or modification (including, without limitation, any costs of any additional land or easement rights necessitated by such relocation, but expressly excluding any costs related to the interruption of transmission of electricity) to be paid at CMP's sole cost and expense. Any such relocation may be required only after (a) at least 90 days prior written notice to NECEC Transmission, which notice shall include detailed plans for NECEC Transmission's review, and (b) any additional land or easement rights, permits or approvals necessitated by such relocation of the CMP Line have been obtained by CMP and delivered to NECEC Transmission, to NECEC Transmission's reasonable satisfaction. Any such relocation or modification shall be undertaken by NECEC Transmission only at such time as will minimize the disruption of NECEC Transmission's use of the NECEC Transmission Line. The relocation or modification of the NECEC Transmission CMP Line, as proposed by CMP hereunder, shall not unreasonably interfere with the rights granted to NECEC Transmission herein and shall not unreasonably interfere with the utility of the rights of NECEC Transmission existing at the time of said relocation or modification, as reasonably determined by NECEC Transmission.

EXHIBIT C**EASEMENTS, LICENSES AND AGREEMENTS TO WHICH THIS CONVEYANCE IS SUBJECT**

- (i) easements and other rights listed in **SCHEDULE 5 – EASEMENTS, LICENSES AND AGREEMENTS**, attached and made a part hereof;
- (ii) those agreements, permissions and rights, to the extent still in effect, listed in said Schedule 5;
- (iii) rights of the grantors or others reserved, excepted or created in the CMP Deeds.

EXHIBIT D**COVENANTS, TERMS AND CONDITIONS**

The Parties hereby acknowledge, covenant and agree to the following terms and conditions:

1. **NECEC TRANSMISSION LINE EASEMENT AREAS** - CMP hereby covenants and agrees that, with the exception of any CMP Line and the Reserved Substations, it will not, without the prior written consent of NECEC Transmission, erect or permit the erection of any utility, road, gate, fence, barrier, or other structure of any kind or nature within the NECEC Transmission Line Easement Areas or place or permit the placement of any material on, or excavate, remove or permit the removal of any material from the NECEC Transmission Line Easement Areas that, in the reasonable opinion of NECEC Transmission, interferes with or materially impairs the construction, operation, maintenance, repair or replacement of the NECEC Transmission Line. Upon receiving such prior written consent from NECEC Transmission, any such use by CMP or its successors and assignees shall be made in such manner as will not unreasonably interfere with or impair the construction, maintenance, operation, repair or replacement of the NECEC Transmission Line or the exercise by NECEC Transmission of any of its rights under this Easement Deed.

CMP further agrees that it will provide NECEC Transmission reasonable advance notice, consistent with commonly accepted utility practice, with respect to the exercise of CMP's rights in the NECEC Transmission Line Easement Areas, and that such activities shall be made in such manner as will not unreasonably interfere with or impair the construction, operation, maintenance, repair or replacement of the NECEC Transmission Line or the exercise by NECEC Transmission of any of its rights under this Easement Deed; provided however, such notice shall not be required for the exercise of CMP's rights pursuant to paragraphs 1, 2 and 3 of Reservation One of Exhibit B.

NECEC Transmission hereby covenants and agrees that it will not exercise any of its rights under this Easement Deed in that portion of the NECEC Transmission Line Easement Area that overlays the Reserved Substations in such manner as to unreasonably interfere with or impair the CMP's operation, maintenance, repair or replacement of the Reserved Substations.

Notwithstanding anything to the contrary set forth herein, nothing in this Easement Deed shall be deemed to waive or affect the notice provisions of any other agreements between the Parties in existence from time to time.

2. **COMPLIANCE WITH LAWS; PERMIT CONDITIONS** - Any use or activities performed by or on behalf of CMP on or over the NECEC Transmission Line Easement Areas shall be performed in accordance with the requirements of any federal, state, or local codes, rules or ordinances and commonly accepted utility practice (including, without limitation, Safety Regulations) and any NECEC Transmission Line permit condition; and to the extent any such use or activities necessitate alterations or improvements to a NECEC

Transmission Line, as reasonably determined by NECEC Transmission, then CMP shall be responsible for the cost of such alterations or improvements.

Any use or activities performed by or on behalf of NECEC Transmission on or over CMP Land shall be performed in accordance with the requirements of any federal, state, or local codes, rules or ordinances and commonly accepted utility practice (including, without limitation, Safety Regulations) and any NECEC Transmission Line permit condition; and to the extent any such use or activities necessitate alterations or improvements to a CMP Line, as reasonably determined by CMP, then NECEC Transmission shall be responsible for the cost of such alterations or improvements.

3. **DAMAGE TO PROPERTY, EQUIPMENT OR FACILITIES -**

(a) Except as provided in sub-paragraph 3(c) below, NECEC Transmission shall be responsible for all physical damage to or destruction of its equipment and facilities within the CMP Land except to the extent such physical damage or destruction is caused by the willful misconduct or gross negligence of CMP, its employees, agents, representatives or contractors. In the event of any damage to or destruction of NECEC Transmission's equipment or facilities that could reasonably be expected to have an adverse impact upon the CMP Line, NECEC Transmission shall promptly repair its equipment and facilities in a manner that will minimize any adverse impact upon the CMP Line and in accordance with good utility practice. If the damage or destruction of NECEC Transmission's equipment or facilities was caused by the willful misconduct or gross negligence of CMP or its employees, agents, representatives or contractors, CMP will promptly reimburse NECEC Transmission for the reasonable costs incurred by NECEC Transmission in effecting such repairs.

(b) Except as provided in sub-paragraph 3(c) below, CMP shall be responsible for all physical damage to or destruction of its equipment and facilities within the CMP Land except to the extent such physical damage or destruction is caused by the willful misconduct or gross negligence of NECEC Transmission, its employees, agents, representatives or contractors. In the event of any damage to or destruction of CMP's equipment or facilities that could reasonably be expected to have an adverse impact upon a NECEC Transmission Line, CMP shall promptly repair its equipment and facilities in a manner that will minimize any adverse impact upon the NECEC Transmission Line and in accordance with good utility practice. If the damage or destruction of CMP's equipment or facilities was caused by the willful misconduct or gross negligence of NECEC Transmission or its employees, agents, representatives or contractors, NECEC Transmission will promptly reimburse CMP for the reasonable costs incurred by CMP in effecting such repairs.

(c) During the construction of the NECEC Transmission Line and during any final decommissioning of the NECEC Transmission Line, NECEC Transmission shall be responsible for all physical damage to or destruction of CMP's equipment

and facilities within the CMP Land caused by acts or negligence of NECEC Transmission, its employees, agents, representatives or contractors.

(d) Nothing contained herein shall be deemed a release by either Party of any claim against a third party for any damage to or destruction of equipment or facilities within the CMP Land caused by such third party.

4. **INDEMNIFICATION** –

(a) From and after the date hereof, NECEC Transmission shall defend, save harmless, protect and indemnify CMP and its officers, directors, shareholders and affiliates from and against any and all losses, liabilities, damages, claims, suits, demands, actions, judgments, costs and expenses (including court costs and reasonable attorneys' fees) resulting from damage to any property or death or injury to any person that arise from, grow out of, or are attributable to any willful act or gross negligence of NECEC Transmission or its employees, agents, representatives or contractors.

(b) From and after the date hereof, CMP shall defend, save harmless, protect and indemnify NECEC Transmission and its officers, directors, shareholders and affiliates from and against any and all losses, liabilities, damages, claims, suits, demands, actions, judgments, costs and expenses (including court costs and reasonable attorneys' fees) resulting from damage to any property or death or injury to any person that arise from, grow out of, or are attributable to any willful act or gross negligence of CMP or its employees, agents, representatives or contractors.

(c) If a Party intends to seek indemnification under this Easement Deed from the other Party with respect to any claim or action, the Party seeking indemnification shall give the other Party written notice of such claim or action within fifteen (15) days after the receipt of written notice of the assertion or commencement of an action or the receipt of a written notice of claim. Such notice shall describe the claim in reasonable detail and shall indicate the amount (estimated if necessary) of the claim that has been or may be sustained by the Party seeking indemnification. To the extent the other Party shall be actually and materially prejudiced as a result of the failure of the Party seeking indemnification to provide such timely notice, such notice shall be a condition precedent to any liability of the other Party under the provisions for indemnification contained in this Easement Deed. Neither Party shall settle or compromise any claim which is the subject of this Easement Deed without the prior written consent of the other Party, provided that such consent shall not be unreasonably withheld or delayed.

(d) The indemnification obligations of a Party hereunder shall continue in full force and effect regardless of whether rights granted or reserved herein have been terminated and shall not be limited in any way by any limitation on insurance or by any compensation or benefits payable by the Parties under Worker's

Compensation Acts, disability benefit acts or other similar employee protection acts.

5. **ROADS** – To the extent each Party may legally do so, each Party may use the access roads of the other Party. Each Party will maintain roads on which both Parties have access to the extent of the using Party's use. Upon completing use, the using Party will leave the road in substantially the same or better condition as before use began. Neither Party will have any obligation to maintain any road not being used by that Party unless otherwise set forth in the Use Agreement.
6. **ACCESS** - Each Party will provide access to the other Party through any gates through which the other Party has access by means of duplicate keys or dual locks.
7. **STIPULATION OR PERMIT CONDITION** - In the event the NECEC Transmission Line Easement Areas, any other CMP Land that NECEC Transmission is required to clear to construct the Section 432 Transmission Line or the Section 3007 Transmission Line (collectively the “NECEC CLEARING AREAS”) is subjected to any stipulation or permit condition pertaining to vegetation management, including but not limited to stipulations and permit conditions of the Maine Department of Environmental Protection, NECEC Transmission agrees to reimburse CMP for any and all additional costs to CMP resulting from compliance with any such stipulation or condition as applicable to that portion of the NECEC Clearing Areas being maintained by CMP or as may be maintained by CMP in the future.
8. **TAXES, ASSESSMENTS AND OTHER CHARGES** - NECEC Transmission agrees to pay one hundred percent (100%) of any and all taxes, assessments and other impositions assessed or imposed on the NECEC Transmission Line Easement Areas, and the NECEC Transmission Line. If any such taxes are assessed to CMP, but are attributable to the NECEC Transmission Line Easement Areas or the NECEC Transmission Line, NECEC Transmission shall promptly reimburse CMP for the full amount of said tax upon evidence that the same has been paid by CMP, or CMP may require NECEC Transmission to pay such taxes directly and provide CMP with evidence of timely payment. NECEC Transmission shall have the right to employ and to exhaust all available remedies to contest the amount of, and the liability for, such taxes, assessments and other impositions, provided, however, that if a lien shall at any time be filed against CMP's interest in the CMP Land, because of such taxes, assessments or impositions, NECEC Transmission shall cause the same to be discharged of record by either payment, deposit or bond within thirty (30) days after receiving notice of such lien. In addition, if NECEC Transmission shall fail to timely pay any such taxes, assessments and other impositions, CMP may (but shall not be obligated to) make such payment on behalf of NECEC Transmission and such payment may be made prior to any notice or the expiration of any cure period in the event necessary to avoid any penalty, interest, late charge, lien or foreclosure. NECEC Transmission shall promptly reimburse CMP for any such payment made, as well as any costs and expenses incurred by CMP in connection therewith, together with interest through the date of reimbursement at the prime rate as listed in the Wall Street Journal. Notwithstanding anything to the contrary, in the event

that NECEC Transmission no longer uses the NECEC Transmission Line Easement Areas in the course of its business, and has removed the NECEC Transmission Line, then NECEC Transmission shall not be responsible for the payment of any taxes, assessments and other impositions assessed or imposed on the NECEC Transmission Line Easement Areas.

9. **REVERSION** - In the event that the NECEC Transmission Line, or any portion thereof, shall be decommissioned, the easements and rights hereby granted shall automatically terminate and revert to CMP with respect to the NECEC Transmission Line Easement Areas in which the NECEC Transmission Line has been decommissioned. Upon such decommissioning, NECEC Transmission agrees to execute and file such documents as may be necessary to effect a termination of its rights and interests in either or both NECEC Transmission Line Easement Areas, or any portion thereof, under this Easement Deed. Upon the decommissioning of all or any portion of the NECEC Transmission Line, NECEC Transmission shall promptly, and at its expense, remove all poles, wires (including underground wires) and termination stations from each such NECEC Transmission Line Easement Area, and restore the surface of the NECEC Transmission Line Easement Areas to the same condition, so far as may be practicable, as it was prior to the entry and use by NECEC Transmission. Notwithstanding the forgoing, NECEC Transmission shall give CMP reasonable advanced written notice of any plans to decommission all or any portions of the NECEC Transmission Line and CMP may elect to permit NECEC Transmission to abandon some or all of its poles, wires or terminations in place upon such decommissioning such that NECEC Transmission would have no obligation to remove those facilities that CMP permits to be abandoned. As a condition of such permission, CMP may require NECEC Transmission to deliver a bill of sale or other appropriate instrument to CMP releasing any interest in such abandoned facilities to CMP for no additional consideration.
10. **CONSEQUENTIAL AND INDIRECT DAMAGES.** – Notwithstanding anything in this agreement to the contrary, neither Party nor their respective affiliates, nor its or their respective directors, trustees, members, officers, managers, employees, agents or representatives shall be liable under or in connection with this easement deed for any punitive, special, lost profit, exemplary, multiple, incidental, indirect, or consequential damages including in connection with or arising from any performance or lack of performance under this easement deed, regardless of whether (i) any such damages claim is based on contract warranty, tort (including negligence), strict liability, violation of any applicable deceptive trade practices act or any other legal or equitable theory or principle; or (ii) such damages were reasonably foreseeable; of (iii) the parties were advised or aware that such damages might be incurred.

SCHEDULE 1, CMP DEEDS**SECTION 432**

Grantor¹	Interest	Book/Page	Town(s)	County	Date
E.J. Carrier, Inc.	Fee	3902/329	Beattie Twp.	Franklin	4/14/2017
Weyerhaeuser Company	Fee	3872/103	Skinner Twp.	Franklin	11/18/2016
Longchamps and Sons, Inc.	Fee	5098/174	Raytown Twp.	Somerset	11/15/16
Weyerhaeuser Company	Fee	5099/218	Raytown Twp.	Somerset	11/18/2016
Weyerhaeuser Company	Easement	5099/203	Raytown Twp.	Somerset	11/18/2016
Weyerhaeuser Company	Fee	5099/195	Appleton Twp.	Somerset	11/18/2016
Weyerhaeuser Company	Fee	5099/189	Hobbs town Twp.	Somerset	11/18/2016
Weyerhaeuser Company	Fee	5099/211	Bradstreet Twp.	Somerset	11/18/2016
Weyerhaeuser Company	Fee	5099/224	Parlin Pond Twp.	Somerset	11/18/2016
Weyerhaeuser Company	Fee	5099/230	Johnson Mt. Twp.	Somerset	11/18/2016
Weyerhaeuser Company	Easement	5099/237	Johnson Mt. Twp.	Somerset	11/18/2016
Weyerhaeuser Company	Fee	5099/255	West Forks Plt.	Somerset	11/18/2016
Weyerhaeuser Company	Easement	5099/247	West Forks Plt.	Somerset	11/18/2016
S.D. Warren Company	Fee	1416/127	West Forks Plt.	Somerset	3/14/1988
T-M Corporation	Fee	1506/288	West Forks Plt.	Somerset	3/22/1989
	Fee	434/89	West Forks Plt.	Somerset	7/31/1935
Bessemer Securities Corporation	Fee	536/131	West Forks Plt.	Somerset	5/15/1951
Realty Operations Corporation	Fee	536/135	West Forks Plt.	Somerset	5/14/1951
	Fee	536/138	West Forks Plt.	Somerset	5/18/1951
	Fee	536/141	West Forks Plt.	Somerset	5/16/1951
T-M Corporation	Fee	1480/89	Moxie Gore	Somerset	11/10/1988
Hollingsworth & Whitney	Fee	561/166	Bald Mountain/Moscow	Somerset	10/11/1954

¹ Names of individual grantors have been redacted from this form easement.

Grantor¹	Interest	Book/Page	Town(s)	County	Date
Great Northern Paper	Fee	554/474	The Forks/Caratunk	Somerset	10/30/1953
USA	Fee	4507/184	Moscow	Somerset	11/20/1953
Bingham Land Company	Fee	1289/120	Moscow	Somerset	8/15/1986
S.D. Warren Company	Fee	1295/309	Moscow	Somerset	8/28/1986
	Fee	554/466	Moscow	Somerset	10/28/1953
	Fee	554/477	Moscow	Somerset	11/5/1953
	Fee	554/468	Moscow	Somerset	10/28/1953
	Fee	554/469	Moscow	Somerset	10/29/1953
	Fee	557/295	Moscow	Somerset	1/4/1954
	Fee	554/471	Moscow	Somerset	10/28/1953
	Fee	554/473	Moscow	Somerset	10/28/1953
	Fee	554/517	Moscow	Somerset	11/18/1953
S.D. Warren Company	Fee	558/50	Moscow	Somerset	2/13/1954
	Fee	546/280	Moscow	Somerset	10/24/1953
	Fee	554/478	Moscow	Somerset	11/10/1953
	Fee	554/472	Moscow	Somerset	10/28/1953
	Fee	554/470	Moscow	Somerset	10/28/1953
	Fee	554/467	Moscow	Somerset	10/28/1953
	Fee	546/292	Moscow	Somerset	10/27/1953
	Fee	401/83	Moscow	Somerset	3/2/1929
FPL Energy Maine Hydro LLC	Easement	2540/140	Moscow/Concord	Somerset	4/8/1999
	Fee	619/359	Concord	Somerset	10/21/1960
	Fee	619/192	Concord	Somerset	4/2/1960
	Fee	398/458	Concord	Somerset	2/14/1929
	Fee	398/452	Concord	Somerset	2/14/1929
	Fee	398/453	Concord	Somerset	2/14/1929
	Fee	398/454	Concord	Somerset	2/14/1929
	Fee	398/455	Concord	Somerset	2/14/2029
	Fee	398/521	Concord	Somerset	2/14/1929
	Fee	398/443	Concord	Somerset	2/14/1929
	Fee	398/442	Concord	Somerset	2/14/1929
	Fee	398/444	Concord	Somerset	2/14/1929
	Fee	398/445	Concord	Somerset	2/14/1929
	Fee	398/446	Concord	Somerset	2/14/1929
	Fee	401/296	Concord	Somerset	2/14/1929
	Fee	398/463	Concord	Somerset	2/18/1929
	Fee	398/447	Concord	Somerset	2/16/1929
	Fee	398/448	Concord	Somerset	2/13/1929
	Fee	398/449	Concord	Somerset	2/12/1929

Grantor¹	Interest	Book/Page	Town(s)	County	Date
	Fee	411/170	Concord	Somerset	11/4/1930
	Fee	398/457	Concord	Somerset	2/14/1929
	Fee	398/451	Concord	Somerset	2/15/1929
	Fee	401/306	Embden; Concord	Somerset	2/25/1929
	Fee	398/510	Embden	Somerset	3/1/1929
	Fee	398/501	Embden	Somerset	2/25/1929
	Fee	398/499	Embden	Somerset	2/26/1929
	Fee	398/524	Embden	Somerset	3/9/1929
	Fee	398/500	Embden	Somerset	2/25/1929
	Fee	401/305	Embden	Somerset	2/25/1929
	Fee	398/489	Embden	Somerset	2/25/1929
	Fee	398/488	Embden	Somerset	2/25/1929
	Fee	398/497	Embden	Somerset	2/26/2029
	Fee	398/526	Embden	Somerset	3/8/1929
	Fee	398/492	Embden	Somerset	2/25/1929
	Fee	398/490	Embden	Somerset	2/26/1929
	Fee	404/34	Embden	Somerset	3/9/1929
	Fee	400/77	Embden	Somerset	4/22/1929
	Fee	398/491	Embden	Somerset	2/25/1929
	Fee	398/496	Embden	Somerset	2/28/1929
	Fee	398/495	Embden	Somerset	2/26/1929
Pine Tree Timberland Company	Fee	401/307	Embden	Somerset	2/23/1929
	Fee	398/498	Embden	Somerset	2/26/1929
Pine Tree Timberland Company	Fee	398/493	Embden	Somerset	2/23/1929
	Fee	398/494	Embden	Somerset	2/26/1929
	Fee	398/565	Embden	Somerset	3/12/1929
	Fee	404/13	Embden	Somerset	4/13/1929
	Fee	398/536	Embden	Somerset	2/28/1929
	Fee	398/535	Embden	Somerset	3/14/1929
	Fee	398/522	Embden	Somerset	3/8/1929
	Fee	398/517	Embden	Somerset	3/5/1929
	Fee	401/314	Embden	Somerset	3/2/1929
	Fee	401/313	Embden	Somerset	3/2/1929
	Fee	401/370	Embden; Anson	Somerset	3/16/1929
	Fee	398/515	Embden	Somerset	3/5/1929
	Fee	398/512	Embden	Somerset	3/5/1929
	Fee	398/519	Embden	Somerset	3/5/1929
	Fee	398/514	Embden	Somerset	3/6/1929
	Fee	398/511	Anson	Somerset	3/5/1929
	Fee	398/518	Anson	Somerset	3/5/1929
	Fee	398/513	Anson	Somerset	3/5/1929

Grantor¹	Interest	Book/Page	Town(s)	County	Date
	Fee	398/516	Anson	Somerset	3/4/1929
	Fee	398/523	Anson	Somerset	3/5/1929
	Fee	398/580	Anson	Somerset	3/20/1929
	Fee	398/509	Anson	Somerset	3/5/1929
	Fee	398/520	Anson	Somerset	3/4/1929
Great Northern Paper Company	Fee	401/529	Anson	Somerset	4/25/1929
	Fee	398/547	Anson	Somerset	3/12/1929
	Fee	398/566	Anson	Somerset	3/12/1929
	Fee	398/564	Anson	Somerset	3/19/1929
	Fee	401/349	Anson	Somerset	3/12/1929
	Fee	401/348	Anson	Somerset	3/12/1929
	Fee	398/545	Anson	Somerset	3/12/1929
	Fee	398/554	Anson	Somerset	3/12/1929
	Fee	398/555	Anson	Somerset	3/12/1929
	Fee	401/390	Anson	Somerset	3/26/1929
	Fee	398/548	Anson	Somerset	3/13/1929
	Fee	398/456	Anson	Somerset	3/13/1929
	Fee	398/549	Anson	Somerset	3/14/1929
	Fee	413/111	Anson	Somerset	4/24/1931
	Fee	398/551	Anson	Somerset	3/13/1929
	Fee	398/552	Anson	Somerset	3/13/1929
	Fee	401/347	Anson	Somerset	3/14/1929
	Fee	398/553	Anson	Somerset	3/13/1929
	Fee	401/352	Anson	Somerset	3/13/1929
	Fee	401/350	Anson	Somerset	3/13/1929
	Fee	401/351	Anson	Somerset	3/14/1929
	Fee	398/557	Anson	Somerset	3/13/1929
	Fee	398/556	Anson	Somerset	3/14/1929
	Fee	398/558	Anson	Somerset	3/15/1929
	Fee	401/346	Anson	Somerset	3/18/1929
	Fee	398/542	Anson	Somerset	3/16/1929
	Fee	398/543	Anson	Somerset	3/14/1929
	Fee	398/544	Anson	Somerset	3/13/1929
	Fee	398/550	Anson	Somerset	3/15/1929
	Fee	407/162	Anson	Somerset	8/23/1930
	Fee	407/163	Starks	Somerset	8/23/1930
	Fee	407/164	Starks	Somerset	8/23/1930
	Fee	407/326	Starks	Somerset	8/30/1930
	Fee	407/165	Starks	Somerset	8/23/1930
	Fee	407/290	Starks	Somerset	8/23/1930
	Fee	407/166	Starks	Somerset	8/23/1930
	Fee	407/167	Starks	Somerset	8/23/1930
	Fee	408/243	Starks	Somerset	8/23/1930

Grantor¹	Interest	Book/Page	Town(s)	County	Date
	Fee	407/168	Starks	Somerset	8/26/1930
	Fee	408/244	Starks	Somerset	8/27/1930
	Fee	408/245	Starks	Somerset	8/26/1930
	Fee	408/246	Starks	Somerset	8/26/1930
	Fee	407/169	Starks	Somerset	8/30/1930
	Fee	407/170	Starks	Somerset	8/30/1930
	Fee	407/171	Starks	Somerset	8/30/1930
	Fee	408/464	Starks	Somerset	9/5/1930
	Fee	408/247	Starks	Somerset	9/5/1930
	Fee	408/248	Starks	Somerset	9/6/1930
	Fee	408/249	Starks	Somerset	9/6/1930
	Fee	411/230	Starks	Somerset	12/29/1930
	Fee	407/172	Starks	Somerset	9/6/1930
	Fee	407/173	Starks	Somerset	9/6/1930
	Fee	408/250	Starks	Somerset	9/9/1930
	Fee	407/174	Starks	Somerset	9/9/1930
	Fee	407/175	Starks	Somerset	9/9/1930
	Fee	407/176	Starks	Somerset	9/9/1930
Pinetree Timberland Company	Fee	407/186	Starks	Somerset	9/9/1930
	Fee	407/189	Starks; Industry	Somerset	9/12/1930
	Fee	407/190	Starks	Somerset	9/12/1930
	Fee	245/171	Industry	Franklin	9/13/1930
	Fee	245/106	Industry	Franklin	9/30/1930
	Fee	245/109	Industry	Franklin	9/13/1930
	Fee	241/589	Industry	Franklin	9/13/1930
	Fee	245/108	Industry	Franklin	9/13/1930
	Fee	245/168	Industry	Franklin	9/16/1930
	Fee	244/57	Industry	Franklin	9/1/1930
	Fee	245/107	Industry	Franklin	9/17/1930
	Fee	245/105	Industry	Franklin	9/16/1930
	Fee	245/104	Industry	Franklin	9/16/1930
	Fee	241/588	Industry	Franklin	9/16/1930
	Fee	245/173	New Sharon	Franklin	10/4/1930
	Fee	247/103	Industry	Franklin	9/20/1930
	Fee	245/174	New Sharon	Franklin	9/20/1930
	Fee	245/172	New Sharon	Franklin	9/20/1930
	Fee	245/169	New Sharon	Franklin	9/20/1930
	Fee	245/170	New Sharon	Franklin	9/20/1930
	Fee	245/63	New Sharon	Franklin	9/23/1930
	Fee	245/64	New Sharon	Franklin	9/24/1930
	Fee	245/66	Farmington	Franklin	9/25/1930
	Fee	245/65	Farmington	Franklin	9/24/1930
	Fee	245/62	Farmington	Franklin	9/25/1930

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Grantor¹	Interest	Book/Page	Town(s)	County	Date
	Fee	241/591	Farmington	Franklin	9/25/1930
	Fee	241/587	Farmington	Franklin	10/7/1930
	Fee	245/111	Farmington	Franklin	10/1/1930
	Fee	241/561	Farmington	Franklin	9/25/1930
	Fee	241/585	Farmington	Franklin	9/25/1930
	Fee	241/559	Farmington	Franklin	9/26/1930
	Fee	241/556	Farmington	Franklin	9/26/1930
	Fee	241/583	Farmington	Franklin	10/7/1930
	Fee	245/67	Farmington	Franklin	9/26/1930
	Fee	245/161	Farmington	Franklin	8/29/1930
	Fee	245/159	Farmington	Franklin	8/28/1930
	Fee	247/74	Farmington	Franklin	8/28/1930
	Fee	247/70	Farmington	Franklin	8/28/1930
	Fee	245/158	Farmington	Franklin	8/28/1930
	Fee	247/73	Farmington	Franklin	8/28/1930
	Fee	247/71	Farmington	Franklin	8/30/1930
	Fee	245/156	Farmington	Franklin	8/28/1930
	Fee	245/157	Farmington	Franklin	8/27/1930
	Fee	245/143	Farmington	Franklin	9/6/1930
	Fee	245/155	Farmington	Franklin	9/5/1930
	Fee	245/144	Farmington	Franklin	9/5/1930
	Fee	247/29	Farmington	Franklin	9/6/1930
	Fee	247/26	Farmington	Franklin	9/6/1930
	Fee	247/28	Farmington	Franklin	9/5/1930
	Fee	247/32	Farmington	Franklin	9/5/1930
	Fee	245/175	Wilton	Franklin	11/1/1930
	Fee	241/581	Wilton	Franklin	9/10/1930
	Fee	245/141	Wilton	Franklin	9/6/1930
	Fee	247/190	Wilton & Chesterville	Franklin	9/20/1930
	Fee	245/114	Jay	Franklin	9/11/1930
	Fee	247/192	Jay	Franklin	9/9/1930
	Fee	245/140	Jay	Franklin	9/6/1930
	Fee	245/110	Jay	Franklin	9/6/1930
	Fee	245/112	Jay	Franklin	9/10/1930
	Fee	241/596	Jay	Franklin	9/10/1930
	Fee	241/595	Jay	Franklin	9/11/1930
	Fee	241/593	Jay	Franklin	9/10/1930
	Fee	241/584	Jay	Franklin	9/10/1930
	Fee	245/113	Jay	Franklin	9/9/1930
	Fee	247/31	Jay	Franklin	9/11/1930
	Fee	241/539	Jay	Franklin	9/9/1930
	Fee	245/36	Jay	Franklin	9/9/1930
	Fee	245/34	Jay	Franklin	9/5/1930

Grantor¹	Interest	Book/Page	Town(s)	County	Date
	Fee	241/541	Jay	Franklin	9/9/1930
	Fee	245/35	Jay	Franklin	9/5/1930
	Fee	241/558	Jay	Franklin	9/22/1930
	Fee	245/40	Jay	Franklin	9/5/1930
	Fee	241/546	Jay	Franklin	9/11/1930
	Fee	245/38	Jay	Franklin	9/11/1930
	Fee	241/542	Jay	Franklin	9/11/1930
	Fee	241/545	Jay	Franklin	9/12/1930
	Fee	245/33	Jay	Franklin	9/12/1930
	Fee	241/544	Jay	Franklin	9/11/1930
	Fee	245/37	Jay	Franklin	9/11/1930
	Fee	245/39	Jay	Franklin	9/11/1930
	Fee	245/142	Jay	Franklin	10/20/1930
	Fee	358/387	Jay	Franklin	7/3/1959
	Fee	397/508	Jay	Franklin	9/20/1966
	Easement	358/227	Jay	Franklin	4/27/1959
	Fee	358/345	Jay	Franklin	6/7/1959
	Fee	809/261	Jay/Liv Falls	Androscoggin	6/22/1959
	Fee	7958/29	Livermore Falls	Androscoggin	6/17/2010
	Fee	7958/33	Livermore Falls	Androscoggin	6/17/2010
	Fee	8024/190	Livermore Falls	Androscoggin	9/24/2010
	Fee	408/417	Livermore Falls	Androscoggin	12/22/1930
	Fee	408/375	Livermore Falls	Androscoggin	9/23/1930
	Fee	408/283	Livermore Falls	Androscoggin	9/23/1930
	Fee	408/276	Livermore Falls	Androscoggin	9/25/1930
	Fee	413/224	Livermore Falls	Androscoggin	5/9/1931
	Fee	408/152	Livermore Falls	Androscoggin	10/6/1930
	Fee	408/282	Livermore Falls	Androscoggin	9/29/1930
	Fee	408/277	Livermore Falls	Androscoggin	9/26/1930
	Fee	408/210	Livermore Falls	Androscoggin	10/31/1930
	Fee	408/278	Livermore Falls	Androscoggin	11/5/1930
	Fee	408/281	Livermore Falls	Androscoggin	11/8/1930
	Fee	407/370	Livermore Falls	Androscoggin	10/8/1930
	Fee	407/376	Livermore Falls	Androscoggin	10/8/1930
	Fee	408/240	Livermore Falls	Androscoggin	10/3/1930
	Fee	407/405	Livermore Falls	Androscoggin	10/15/1930
	Fee	408/227	Livermore Falls	Androscoggin	10/27/1930
	Fee	408/228	Livermore Falls	Androscoggin	10/27/1930
	Fee	407/366	Livermore Falls	Androscoggin	10/8/1930
	Fee	408/243	Livermore Falls	Androscoggin	9/17/1930
	Fee	408/233	Livermore Falls	Androscoggin	10/3/1930
	Fee	408/239	Livermore Falls	Androscoggin	9/18/1930
	Fee	408/236	Livermore Falls	Androscoggin	9/18/1930
	Fee	408/237	Livermore Falls	Androscoggin	9/18/1930

Grantor¹	Interest	Book/Page	Town(s)	County	Date
	Fee	408/241	Livermore Falls	Androscoggin	9/18/1930
	Fee	408/215	Livermore Falls	Androscoggin	11/4/1930
	Fee	408/279	Livermore Falls	Androscoggin	9/25/1930
	Fee	408/242	Livermore Falls	Androscoggin	9/19/1930
	Fee	408/234	Livermore Falls	Androscoggin	9/18/1930
	Fee	407/368	Livermore Falls	Androscoggin	10/9/1930
	Fee	408/156	Livermore Falls	Androscoggin	10/10/1930
	Fee	408/150	Leeds	Androscoggin	10/10/1930
	Fee	407/372	Leeds	Androscoggin	10/9/1930
	Fee	407/374	Leeds	Androscoggin	10/15/1930
	Fee	408/148	Leeds	Androscoggin	10/10/1930
	Fee	408/229	Leeds	Androscoggin	10/20/1930
	Fee	408/232	Leeds	Androscoggin	10/28/1930
	Fee	408/271	Leeds	Androscoggin	11/12/1930
	Fee	408/244	Leeds	Androscoggin	10/20/1930
	Fee	408/230	Leeds	Androscoggin	10/20/1930
	Fee	408/196	Leeds	Androscoggin	10/31/1930
	Fee	407/407	Leeds	Androscoggin	10/28/1930
	Fee	408/158	Leeds	Androscoggin	10/21/1930
	Fee	407/362	Leeds	Androscoggin	10/20/1930
	Fee	407/364	Leeds	Androscoggin	10/21/1930
	Fee	408/154	Leeds	Androscoggin	10/22/1930
	Fee	408/149	Leeds	Androscoggin	10/18/1930
	Fee	407/360	Leeds	Androscoggin	10/18/1930
	Fee	408/231	Leeds	Androscoggin	10/28/1930
	Fee	408/153	Leeds	Androscoggin	10/17/1930
	Fee	408/157	Leeds	Androscoggin	10/17/1930
	Fee	408/155	Leeds	Androscoggin	10/17/1930
	Fee	408/147	Leeds	Androscoggin	10/17/1930
	Fee	407/416	Leeds	Androscoggin	10/23/1930
	Fee	408/270	Leeds	Androscoggin	10/18/1930
	Fee	408/199	Leeds	Androscoggin	10/25/1930
	Fee	408/151	Leeds	Androscoggin	10/17/1930
	Fee	408/224	Leeds	Androscoggin	10/17/1930
	Fee	408/238	Leeds	Androscoggin	10/28/1930
	Fee	408/380	Leeds	Androscoggin	10/21/1930
	Fee	408/195	Leeds	Androscoggin	10/21/1930
	Fee	407/524	Leeds	Androscoggin	10/23/1930
	Fee	408/214	Leeds & Greene	Androscoggin	10/21/1930
	Fee	407/560	Greene	Androscoggin	12/8/1930
	Fee	408/203	Greene	Androscoggin	10/22/1930
	Fee	408/208	Greene	Androscoggin	10/21/1930
	Fee	408/209	Greene	Androscoggin	10/22/1930
	Fee	408/218	Greene	Androscoggin	10/22/1930

Grantor¹	Interest	Book/Page	Town(s)	County	Date
	Fee	408/216	Greene	Androscoggin	10/23/1930
	Fee	408/275	Greene	Androscoggin	10/24/1930
	Fee	408/200	Greene	Androscoggin	10/24/1930
	Fee	408/202	Greene	Androscoggin	10/23/1930
	Fee	408/206	Greene	Androscoggin	10/17/1930
	Fee	408/205	Greene	Androscoggin	10/23/1930
	Fee	408/211	Greene	Androscoggin	10/24/1930
	Fee	408/198	Greene	Androscoggin	10/24/1930
	Fee	408/197	Greene	Androscoggin	10/24/1930
	Fee	408/212	Greene	Androscoggin	10/23/1930
	Fee	408/207	Greene	Androscoggin	10/23/1930
	Fee	408/379	Greene	Androscoggin	11/8/1930
	Fee	407/403	Greene	Androscoggin	10/24/1930
	Fee	408/201	Greene	Androscoggin	10/23/1930
	Fee	408/194	Greene	Androscoggin	10/28/1930
	Fee	408/268	Greene	Androscoggin	11/4/1930
	Fee	407/439	Greene	Androscoggin	11/5/1930
	Fee	408/274	Greene	Androscoggin	11/6/1930
	Fee	511/402	Greene	Androscoggin	7/23/1940
	Fee	408/267	Greene	Androscoggin	11/5/1930
	Fee	511/403	Greene	Androscoggin	7/2/1940
	Fee	407/439	Greene	Androscoggin	11/5/1930
	Fee	408/269	Greene	Androscoggin	11/5/1930
	Fee	408/266	Greene	Androscoggin	11/8/1930
	Fee	408/376	Greene	Androscoggin	11/7/1930
	Fee	407/439	Greene	Androscoggin	11/5/1930
	Fee	408/280	Greene	Androscoggin	11/5/1930
	Fee	408/273	Greene	Androscoggin	11/7/1930
	Fee	408/272	Lewiston	Androscoggin	11/7/1930
	Fee	407/526	Lewiston	Androscoggin	11/14/1930

SECTION 3007

Grantor¹	Interest	Book/Page	Town(s)	County	Date
	Fee	407/526	Lewiston	Androscoggin	11/14/1930
	Fee	408/420	Lewiston	Androscoggin	1/5/1931
	Fee	408/478	Lewiston	Androscoggin	1/9/1931
	Fee	7969/262	Lewiston	Androscoggin	7/2/2010
	Fee	8236/64	Lewiston	Androscoggin	9/9/2011
	Fee	7973/221	Lewiston	Androscoggin	7/8/2010
	Fee	8012/263	Lewiston	Androscoggin	9/13/2010
	Fee	954/268	Lewiston	Androscoggin	1/28/1966
	Fee	956/515	Lewiston	Androscoggin	4/6/1966

Notes: Some of the CMP Deeds listed above reference initial acquisitions by Central Securities Corporation (“CESC”), which was a wholly-owned subsidiary of CMP. The CMP Land included in the lands acquired pursuant to such instruments were conveyed by CESC to CMP pursuant to the following instruments:

- CESC conveyed to Central Maine Power Company by the following deed: Androscoggin County Registry of Deeds Book 450 Page 425, Somerset County Registry of Deeds Book 434 Page 79 and Franklin County Registry of Deeds Book 259 Page 64
- CESC conveyed to Central Maine Power Company by the following deed: Androscoggin County Registry of Deeds Book 407 Page 663, Somerset County Registry of Deeds Book 408 Page 525 and Franklin County Registry of Deeds Book 247 Page 229
- CESC was dissolved and merged into CMP, effective December 31, 2005, pursuant to the applicable Articles of Merger as recorded in the following registries: Androscoggin County Registry of Deeds Book 6961 Page 170, Somerset County Registry of Deeds Book 3761 Page 304 and Franklin County Registry of Deeds Book 2845 Page 205

SCHEDULE 2, SECTION 432 TRANSMISSION LINE CENTERLINE DESCRIPTION

[To be revised and updated prior to the execution of the Easement Deed, including in order to reflect changes needed to conform to the NECEC Transmission Line detail engineering design.]

The Section 432 Transmission Line Centerline is more particularly described as follows:

Being so much of the CMP Land within 75 feet of either side of a centerline and the extensions thereof, so as to form a corridor of straight tangents without curves or radii, beginning at a point on the easterly side of land of NECEC Transmission described in a deed from CMP dated _____ and recorded in the Androscoggin County Registry of Deeds in Book _____, Page _____, said point being S 66°53'40" E a distance of 225 feet, more or less, from a proposed Structure 2 with coordinates of N 16043543.310, E 1330262.826; thence N 66°53'40" W a distance of 225 feet more or less to said Structure 2; thence by and along the centerline set forth in the following table to a point in said Beattie Township near the border between the Province of Quebec and the State of Maine at Structure 804;

Structure	Structure Coordinate Northing	Structure Coordinate Easting	Ahead Distance (Feet)	Ahead Bearing
2	16043543.310	1330262.826	3,519.6	N 23°49'10" E
6	16046763.130	1331684.244	1,612.8	N 28°38'11" E
8	16048178.680	1332457.198	15,109.7	N 05°30'25" E
23	16063218.650	1333907.243	717.4	N 11°41'24" E
24	16063921.190	1334052.605	4,261.9	N 05°27'45" E
32	16068163.760	1334458.319	1,135.8	N 01°58'49" E
34	16069298.920	1334497.566	17,107.0	N 05°18'37" E
50	16085197.290	1336041.576	13,384.8	N 01°22'40" W
64	16098578.230	1335719.742	12,161.7	N 01°18'21" W
76	16110736.780	1335442.594	10,138.7	N 31°54'04" E
86	16119344.130	1340800.453	18,053.6	N 01°15'04" W
106	16137393.380	1340406.248	3,373.8	N 14°14'58" W
109	16140663.340	1339575.819	18,782.9	N 13°58'34" W
129	16158890.240	1335039.432	1,650.0	N 22°24'16" W
131 ¹	16160415.690	1334410.550	499.4	N 08°16'33" E
132	16160909.930	1334482.440	5,802.1	N 14°01'42" W
138	16166538.980	1333076.000	27,861.0	N 13°48'08" E
167	16193595.500	1339722.868	1,240.0	N 13°42'22" E
169	16194800.200	1340016.679	18,482.2	N 13°14'15" E
189	16212791.290	1344248.898	7,382.8	N 04°11'35" E
197	16220154.290	1344788.716	4,110.2	N 25°58'58" E

Structure	Structure Coordinate Northing	Structure Coordinate Easting	Ahead Distance (Feet)	Ahead Bearing
201	16223849.030	1346589.376	773.1	N 25°58'57" E
202 ²	16224544.010	1346928.076	902.9	N 25°58'58" E
203	16225355.620	1347323.623	5,227.3	N 25°54'57" E
208	16230057.270	1349608.231	15,185.5	N 49°26'37" E
224	16239930.830	1361145.703	30,437.6	N 49°13'34" E
255	16259808.870	1384195.886	1,547.1	N 55°23'51" E
257	16260687.440	1385469.322	19,287.6	N 62°41'23" E
277	16269536.790	1402607.021	1,244.2	N 62°41'22" E
279 ³	16270107.630	1403712.510	636.3	N 62°41'23" E
280	16270399.560	1404277.868	26,315.1	N 14°14'48" E
306	16295905.390	1410753.956	723.3	N 14°35'30" E
307	16296605.340	1410936.171	14,729.7	N 01°46'13" W
322	16311327.960	1410481.140	5,340.5	N 01°23'52" E
328	16316666.880	1410611.424	2,948.9	N 01°30'17" E
331	16319614.720	1410688.863	8,081.1	N 01°37'46" E
339	16327692.550	1410918.665	9,463.9	N 01°47'56" E
348	16337151.770	1411215.762	6,551.7	N 01°57'56" E
355	16343699.570	1411440.463	4,497.4	N 02°07'01" E
360	16348193.930	1411606.586	8,691.9	N 02°15'23" E
368	16356879.050	1411948.814	2,618.5	N 02°28'18" E
371	16359495.090	1412061.734	6,491.9	N 02°33'13" E
378	16365980.500	1412350.973	7,077.0	N 43°33'31" W
385	16371109.010	1407474.242	1,008.1	N 08°52'26" E
386	16372105.050	1407629.755	884.4	N 08°52'26" E
387	16372978.900	1407766.190	1,219.0	N 08°52'26" E
388	16374183.300	1407954.233	295.1	N 08°52'27" E
389	16374474.890	1407999.760	277.6	N 08°52'26" E
390	16374749.170	1408042.583	742.5	N 37°29'45" W
391	16375338.230	1407590.649	511.0	N 04°18'58" W
392	16375847.830	1407552.188	1,019.2	N 60°43'45" E
393	16376346.160	1408441.260	2,149.6	N 60°43'44" E
395	16377397.190	1410316.378	17,178.0	N 27°47'44" E
412	16392593.130	1418326.762	6,187.7	N 39°01'52" E
419	16397399.780	1422223.425	2,951.1	N 18°00'06" W
422	16400206.420	1421311.408	4,502.4	N 72°22'58" E
426	16401569.090	1425602.608	4,379.4	N 38°55'14" E
430	16404976.350	1428353.936	13,911.0	N 09°26'45" E
444	16418698.750	1430636.954	4,208.8	N 14°41'04" E

Structure	Structure Coordinate Northing	Structure Coordinate Easting	Ahead Distance (Feet)	Ahead Bearing
448	16422770.050	1431703.858	2,135.5	N 06°04'37" E
450	16424893.590	1431929.934	12,510.5	N 13°56'29" W
462	16437035.520	1428915.785	6,009.9	N 29°39'57" W
469	16442257.700	1425941.220	15,994.6	N 03°26'49" W
487	16458223.370	1424979.551	5,635.5	N 19°04'56" W
494	16463549.180	1423137.165	8,548.2	N 36°23'38" W
506	16470430.130	1418065.244	7,587.4	N 28°22'19" W
516	16477106.140	1414459.745	605.1	N 32°43'59" W
517	16477615.130	1414132.565	1,500.7	N 28 46'15" W
519	16478930.530	1413410.293	7,595.7	N 77°50'24" W
527	16480530.520	1405985.030	3,045.3	N 14°51'35" W
530	16483473.940	1405204.058	2,346.1	N 61°34'46" W
533	16484590.540	1403140.710	3,086.7	N 85°14'32" W
MGTS ⁴	16484846.560	1400064.611		
WFPTS ⁵	16486721.030	1397031.043	8,486.5	N 00°34'15" W
544	16495207.110	1396946.481	5,980.2	N 49°15'33" W
550	16499110.020	1392415.475	1,582.3	N 67°14'54" W
552	16499721.970	1390956.267	1,540.5	N 30°45'53" W
554	16501045.720	1390168.260	3,340.6	N 49°15'33" W
558	16503225.900	1387637.220	8,765.8	N 17°05'29" W
567	16511604.540	1385060.998	9,624.0	S 80°20'17" W
577	16509989.320	1375573.505	2,885.2	S 47°22'21" W
580	16508035.390	1373450.676	943.1	N 49°11'21" W
581	16508651.770	1372736.866	738.6	N 66°23'30" W
582	16508947.580	1372060.050	14,595.9	S 74°05'31" W
597	16504946.880	1358023.101	13,477.9	N 14°20'49" W
610	16518004.400	1354683.398	8,783.8	N 33°14'31" E
619	16525350.860	1359498.468	10,022.3	N 38°56'00" W
629	16533146.950	1353200.300	4,171.6	N 59°12'04" W
633	16535282.930	1349617.011	1,012.1	S 77°50'47" W
634	16535069.860	1348627.638	5,749.7	N 65°29'20" W
640	16537455.230	1343396.140	10,496.6	S 66°49'16" W
651	16533323.740	1333746.798	10,813.4	S 74°09'12" W
662	16530370.970	1323344.363	7,987.3	N 77°40'31" W
670	16532075.870	1315541.158	5,478.3	S 51°14'45" W
675	16528646.590	1311268.994	1,858.6	S 20°22'44" W
677	16526904.280	1310621.762	12,347.4	S 72°05'56" W
690	16523108.990	1298872.099	1,205.2	N 76°51'37" W

Structure	Structure Coordinate Northing	Structure Coordinate Easting	Ahead Distance (Feet)	Ahead Bearing
692	16523382.970	1297698.429	9,694.2	S 79°29'20" W
703	16521614.490	1288166.859	6,280.6	N 89°35'37" W
710	16521659.050	1281886.419	1,740.9	S 44°53'18" W
712	16520425.670	1280657.839	3,863.2	S 79°08'56" W
717	16519698.390	1276863.726	6,164.7	N 72°02'17" W
724	16521599.490	1270999.526	14,019.4	S 88°12'07" W
738	16521159.630	1256986.989	2,261.8	S 71°34'35" W
740	16520444.810	1254841.121	4,366.4	N 83°16'29" W
744	16520956.160	1250504.799	8,335.9	S 88°12'07" W
752	16520694.600	1242172.995	11,044.7	N 80°42'51" W
763	16522476.770	1231273.001	7,718.3	N 24°05'23" W
771	16529522.850	1228122.648	5,310.7	N 77°44'28" W
776	16530650.470	1222933.007	3,262.5	N 08°51'41" W
780	16533874.040	1222430.428	4,058.2	S 77°48'23" W
784	16533016.880	1218463.744	6,449.3	N 77°03'01" W
790	16534462.140	1212178.483	14,227.0	N 63°12'53" W
804	16540873.530	1199477.973		

Thence continuing on the bearing of N 63°12'53" W a distance of 64.5 feet, more or less to the border between the Province of Quebec, Canada and the State of Maine. All coordinates and bearings are State Plane Coordinates, NAD 83, Zone 19 North.

Footnotes

- ¹ – Livermore Falls Substation structures 130-131
- ² – Sturtevant Substation structure 202
- ³ – Starks Substation structures 197-200
- ⁴ – Moxie Gore Termination Station
- ⁵ – West Forks Plantation Termination Station

SCHEDULE 3, SECTION 3007 TRANSMISSION LINE CENTERLINE DESCRIPTION

[To be revised and updated prior to the execution of the Easement Deed, including in order to reflect changes needed to conform to the NECEC Transmission Line detail engineering design.]

The Section 3007 Transmission Line Centerline is more particularly described as follows:

Being so much of the CMP Land within 75 feet of either side of a centerline and the extensions thereof, so as to form a corridor of straight tangents without curves or radii, beginning at a point on the easterly side of land of NECEC Transmission described in a deed from CMP dated _____ and recorded in the Androscoggin County Registry of Deeds in Book _____, Page _____, said point being S 66°14'19" E a distance of 225 feet, more or less, from a proposed Structure 1 with coordinates of N 16043235.950, E 1330037.713; thence N 66°14'19" W a distance of 225 feet more or less to said Structure 1; thence by and along the centerline set forth in the following table to a point in CMP's Larrabee Road Substation located easterly of Larrabee Road in the City of Lewiston, Androscoggin County, Maine;

Structure	Structure Coordinate Northing	Structure Coordinate Easting	Ahead Distance (Feet)	Ahead Bearing
Merrill Road	16043098.860	1330349.107	340.2	N 66°14'19" W
1	16043235.950	1330037.713	4093.7	S 23°57'42" W
8	16039495.070	1328375.147	414.7	S 27°14'26" E
9	16039126.370	1328564.964	672.7	S 32°07'35" E
10	16038556.690	1328922.690	205.5	S 04°05'32" E
11	16038351.680	1328937.357	311.8	S 40°20'43" W
12	16038114.040	1328735.500	558.7	S 09°30'00" E
Larrabee Road	16037562.960	1328827.719		

All bearings and coordinates are State Plane Coordinates, NAD 83, Zone 19 North.

SCHEDULE 4 – EXISTING CMP LINE CROSSING LOCATIONS*[To be updated prior to execution of the Easement Deed.]*

For the Section 3007 Transmission Line, the CMP Line crossings listed on the following table:

<u>Section</u>	<u>Town</u>	<u>Coordinates of approximate crossing point</u>	
		<u>Northing</u>	<u>Easting</u>
Section 251	City of Lewiston	16043036.211	1330215.898
Section 200	City of Lewiston	16043077.845	1330128.102
Section 298 (ADSS fiber)	City of Lewiston	16041013.409	1329039.782
Section 268	City of Lewiston	16039685.325	1328447.066
Section 76	City of Lewiston	16039848.908	1328513.765
Section 61	City of Lewiston	16038552.057	1328927.873
Section 255	City of Lewiston	16038440.542	1328933.253

For the Section 432 Transmission Line, the CMP Line crossings listed on the following table:

<u>Section</u>	<u>Town</u>	<u>Coordinates of approximate crossing point</u>	
		<u>Northing</u>	<u>Easting</u>
Section 251	City of Lewiston	16043503.993	1330422.394
Section 200	City of Lewiston	16043543.593	1330333.024
Leeds Substation Tap South	Leeds	16108439.261	1335488.568
Leeds Substation Tap North	Leeds	16108492.181	1335490.668
Section 200A	Livermore Falls	16143080.829	1338975.773
Section 89	Livermore Falls	16160846.938	1334467.472
Section 243A	Jay	16166060.389	1333203.168
Nestle Line	Farmington	16227734.700	1348468.686
T-2 Line	Farmington	16227754.089	1348478.365
Section 44	Anson	16294707.238	1410445.392
Section 63	Moscow	16374264.554	1407963.403
Section 83	Moscow	16374353.268	1407981.153
Section 264	Moscow	16374563.471	1408008.515
Section 66	Moscow	16374664.390	1408026.756
Section 222 (Wyman)	Moscow	16375799.199	1407561.697
Section 222 (MAFB South)	Moscow	16397362.847	1422169.965
Section 222 (MAFB North)	Moscow	16401708.090	1425690.306
Section 222A	Moscow	16408778.464	1428982.301
Jackman Tie Line	West Forks Plt.	16507605.497	1386302.052

Coordinates are State Plane, NAD 83, Zone 19 North

Also reserving to CMP, its successors and assigns, all distribution lines currently located within the Section 3007 Transmission Line and Section 432 Transmission Line Easement Areas, including but not limited to, the lines listed on the following table. A distribution line, for the purpose of this reservation, is an electric line with a voltage of 34,500 volts or less.

Distribution line crossings:

<u>Section</u>	<u>Road name</u>	<u>Town</u>	<u>County</u>
3007	Merrill Rd	City of Lewiston	Androscoggin
432	Route 202/11	Greene	Androscoggin
	Dagget Hill Rd & driveway	Greene	Androscoggin
	Meadow Hill Rd	Greene	Androscoggin
	Packard Rd & driveway	Greene	Androscoggin
	Allen Pond Campground Rd	Greene	Androscoggin
	Rose Rd	Greene	Androscoggin
	Allen Pond Rd & driveway	Greene	Androscoggin
	Linda Rd	Greene	Androscoggin
	N Line Rd	Greene/Leeds	Androscoggin
	Church Hill Rd	Leeds	Androscoggin
	River Rd	Leeds	Androscoggin
	Fish Rd	Leeds	Androscoggin
	Route 219	Leeds	Androscoggin
	Campbell Rd	Leeds	Androscoggin
	Knapp Rd	Leeds	Androscoggin
	Strickland Loop Rd (south)	Livermore Falls	Androscoggin
	Strickland Loop Rd (north)	Livermore Falls	Androscoggin
	River Rd	Livermore Falls	Androscoggin
	Lyman Lane	Livermore Falls	Androscoggin
	Androscoggin Bluff	Livermore Falls	Androscoggin
	Bear Brook Rd	Livermore Falls	Androscoggin
	Hillman Ferry Rd	Livermore Falls	Androscoggin
	Route 133	Livermore Falls	Androscoggin
	Pomeroy Rd	Livermore Falls	Androscoggin
	Fayette Rd (Rt 17)	Livermore Falls	Androscoggin
	Moose Hill Rd	Livermore Falls	Androscoggin
	Turmel Rd	Livermore Falls	Androscoggin
	Claybrook Rd	Jay	Franklin
	East Jay Rd	Jay	Franklin
	Belanger Rd	Jay	Franklin
	Plaisted Rd	Jay	Franklin
	Soules Hill Rd	Jay	Franklin
	Route 156	Chesterville	Franklin
	Mc Grillis Corner Rd	Wilton	Franklin
	Webster Rd	Farmington	Franklin
	Knowlton Corner Rd	Farmington	Franklin
	Whittier Rd	Farmington	Franklin
	Route 2	Farmington	Franklin
432	Davis Rd	Farmington	Franklin
	Bailey Hill Rd	Farmington	Franklin
	Osborne Rd	Farmington	Franklin
	Perham Hill -Weeks Mill	Farmington	Franklin
	Hardy Lane	Farmington	Franklin

<u>Section</u>	<u>Road name</u>	<u>Town</u>	<u>County</u>
	Clearwater Rd	New Sharon	Franklin
	Goodrich-Odell Rd	New Sharon	Franklin
	Bailey Rd	Industry	Franklin
	Route 43	Industry	Franklin
	Sawyers Mill Rd	Starks	Somerset
	Mayhew Rd	Starks	Somerset
	Redneck Rd	Starks	Somerset
	Starks Rd (Rt 43)	Starks	Somerset
	Starks Rd (Rt 43 - Main St)	Anson	Somerset
	Lloyd Rd & driveway	Anson	Somerset
	Brookerville Rd	Anson	Somerset
	Campground Rd	Anson	Somerset
	River Rd (Rt 8)	Anson	Somerset
	Madison St	Anson	Somerset
	Solon Rd (Rt 8 & 201A)	Anson	Somerset
	Across Town Rd	Embden	Somerset
	Bert Berry Rd	Embden	Somerset
	Jackson Pond Rd	Concord	Somerset
	Fletcher Mountain Rd	Concord	Somerset
	Pleasant Ridge Rd	Concord	Somerset
	Route 201	Moscow	Somerset
	Donigan Rd	Moscow	Somerset
	Burns Rd	Moscow	Somerset
	Henry Beaudoin Rd	Moscow	Somerset
	Lake Moxie Rd	The Forks	Somerset
	Route 201	Johnson Mountain	Somerset

Schedule 5
Existing Easements, Licenses and Agreements on CMP Land

[To be updated prior to execution of the Easement Deed.]

(i) Easements

<u>Town</u>	<u>County</u>	<u>Section</u>	<u>Grantee²</u>	<u>Date</u>	<u>Book/Page</u>
Bald Mt./Caratunk	Somerset	222	United States of America	2/18/1987	1324/19
Moxie Gore	Somerset	222		2/10/1998	2395/193
Moxie Gore	Somerset	222		9/7/2000	2718/196
The Forks	Somerset	222	Milton & CMP	12/5/1960	753/21
The Forks	Somerset	222	New England Telephone & Telegraph Co.	10/7/1994	2051/175
The Forks	Somerset	222	Great Northern Paper	10/30/1953	554/474
Moscow	Somerset	222	United States of America	9/17/1987	1375/308
Moscow	Somerset	222	United States of America	9/17/1987	1375/306
Moscow	Somerset	222	Bingham Land Company	12/21/1953	554/518
Moscow	Somerset	222		9/9/1986	1291/258
Moscow	Somerset	222		2/12/2007	3815/255
Moscow	Somerset	222		5/4/1995	2095/112
Moscow	Somerset	63	FPL Energy	4/5/1999	2540/140
Embden	Somerset	63		9/4/1997	2347/58
Embden	Somerset	63		11/15/1947	592/452
Embden	Somerset	63		4/23/1958	596/102
Anson	Somerset	63		7/22/1988	1453/167
Industry	Franklin	63		5/5/2015	3728/332
Farmington	Franklin	278		6/1/2006	2766/149
Farmington	Franklin	278		8/28/1930	247/71
Jay	Franklin	278		6/3/1992	1293/317
Livermore Falls	Androscoggin	200		9/27/2010	8028/103
Livermore Falls	Androscoggin	200		9/27/2010	8024/196
Livermore Falls	Androscoggin	200	Livermore Falls Cemetery Assoc.	5/29/2018	9856/53
Livermore Falls	Androscoggin	200	Androscoggin Bluffs	2/16/1978	1322/54
Leeds	Androscoggin	200		1/24/1957	408/204 – 408/151
Leeds	Androscoggin	200		8/1/1957	408/238
Leeds	Androscoggin	200		8/31/1970	1022/691
Leeds	Androscoggin	200		2/24/1993	2997/230
Leeds	Androscoggin	200		8/8/1984	1752/305

² Names of individual grantees have been redacted from this form easement.

<u>Town</u>	<u>County</u>	<u>Section</u>	<u>Grantee²</u>	<u>Date</u>	<u>Book/Page</u>
Greene	Androscoggin	200		9/10/1980	408/211
Greene	Androscoggin	200		11/26/2007	7348/118
Greene	Androscoggin	200		2/27/1984	1715/46
Greene	Androscoggin	200		4/24/1984	1718/195
Greene	Androscoggin	200		5/31/2004	5960/295
Greene	Androscoggin	200		9/27/2006	6934/292
Greene	Androscoggin	200		4/28/2011	10727/269
Greene	Androscoggin	200		5/16/2012	8478/272
Greene	Androscoggin	200		6/22/2006	6855/101
Greene	Androscoggin	200		2/9/2010	8013/314
Lewiston	Androscoggin	200	Society of Dominican Fathers Cemetery	4/16/1964	935/463
Lewiston	Androscoggin	200		5/7/1994	3330/338

(ii) those agreements, permissions and rights, to the extent still in effect, listed below:

<u>Instrument</u>	<u>Town</u>	<u>Section</u>	<u>Landowner³</u>	<u>Date</u>	<u>Notes</u>
License	The Forks	222	Lake Moxie ATV Riders	6/25/2007	Recreational Trail
Permission	Concord	63		7/2/1997	Agricultural use, yard and garden
Permission	Concord	63		6/30/1997	Yard and garden
Permission	Concord	63		7/2/1997	Yard and garden
Permission	Concord	63		8/15/1994	Road / driveway
License	Concord	63		11/17/1992	Water line
Agreement	Embden	63		10/5/2005	Fill & edge of building
License	Embden	63	Moose Alley ATV & Abanaki Snow Riders	12/7/2007	Recreational trail
Permission	Embden	63		1/17/1961	Agricultural use
Agreement	Anson	63		11/16/1983	Agricultural use
Agreement	Anson	63		4/9/1987	Farm road
Agreement	Anson	63		6/5/1986	Recreational fields
Permission	Anson	63		11/1/1978	Driveway
Permission	Anson	63	MSAD# 74	6/19/1970	Recreational field & park area
Agreement	Starks	63		1/29/1982	Driveway
Consent	Starks	63	Madison Electric Works	9/3/1998	Distribution line
Permission	Starks	63		9/16/1999	Road / driveway
Permission	Starks	63		9/7/1978	Drainage way
Permission	Starks	63		7/30/1975	Distribution line
License	Starks	63	Starks Trail Riders ATV	10/9/2009	Recreational trail
Permission	Industry	63		8/28/1978	Road / driveway

³ Names of individual landowners have been redacted from this form easement.

Permission	New Sharon	63	Linc's Electric	11/1/2002	Distribution line
Permission	Concord	63		4/6/1944	Agricultural
Agreement	Farmington	278		8/28/1930	Agricultural uses
Permission	Farmington	278		1/2/2004	Distribution line
Permission	Farmington	278	Town of Farmington	1/22/1971	Sign
Agreement	Wilton	278		7/31/2006	Drainage way
Agreement	Wilton & Chesterville	63		5/10/2002	Agricultural uses / spring
Agreement	Jay	278		10/15/1987	Agricultural uses
Permission	Jay	278		9/28/1995	Remove plants
Permission	Livermore Falls	200	Bowman Field Flying Club	10/4/2010	Marker balls
Agreement	Livermore Falls	200		10/20/2004	Underground pipe & lawn
Agreement	Livermore Falls	200		12/7/2000	Agricultural use
Agreement	Livermore Falls	200		7/25/1993	Road / driveway
Agreement	Livermore Falls	200		11/12/2004	Underground drainage
Permission	Livermore Falls	200		11/8/2010	Agricultural use
License	Livermore Falls	200		6/27/1989	Road / driveway
Agreement	Leeds	200		10/9/1972	Agricultural use
Permission	Leeds	200		8/13/2012	Livestock gate
Permission	Leeds	200		12/16/1976	Agricultural use
Permission	Leeds	200		11/18/1998	Hunting
License	Leeds	200		8/22/1992	Agricultural user
License	Leeds	200	Leeds Stump Jumpers	6/8/2001	Recreational trail
Agreement	Greene	200	Town of Greene	11/6/1986	Driveway / turnaround
Agreement	Greene	200		10/13/2007	Driveway
Permission	Greene	200		11/2/2010	Shed

EXHIBIT C

Form of Merrill Strip Easement Assignment

ASSIGNMENT OF TRANSMISSION CORRIDOR EASEMENT

THIS ASSIGNMENT OF TRANSMISSION CORRIDOR EASEMENT ("Assignment") is made as of as of _____ day of _____, _____, by and among by and among **Central Maine Power Company**, a Maine corporation with its principal place of business at 83 Edison Drive, Augusta, Maine (hereinafter called "Assignor") and **NECEC Transmission LLC**, a Delaware limited liability company, with its principal place of business at One City Center 5th Floor, Portland, Maine, 04101 ("Assignee").

WITNESSETH:

WHEREAS, Assignor is the grantee under a certain Transmission Corridor Easement between Bayroot LLC, as grantor (hereinafter called the "Grantor") and Central Maine Power Company dated August 28, 2019 and recorded in the Franklin County Registry of Deeds in Book 4118, Page 37, as affected by an Agreement Affecting Transmission Corridor Easement between Bayroot, LLC and Assignor dated August 28, 2019 (the Transmission Corridor Easement together with the Agreement Affecting Transmission Corridor Easement are, collectively, the "Merrill Strip Easement").

WHEREAS, Assignor and Assignee wish to enter into this Assignment Agreement for the purpose of assigning the Merrill Strip Easement and Assignor's rights and obligations thereunder, in its entirety, to Assignee.

WHEREAS, coincident with the assignment of the Merrill Strip Easement, Assignee shall become a holder of an easement of no less than one hundred and fifty feet (150) width of the abutting corridor parcels in Beattie Township and Skinner Township contiguous with the Merrill Strip Easement with rights to construct and operate a 320kv transmission line and is, therefore, a permitted assignee under the terms of the Merrill Strip Easement.

NOW, THEREFORE, in consideration of the mutual premises and covenants contained herein, the receipt and sufficiency of which are hereby expressly acknowledged, the parties hereto agree as follows:

1. Assignment and Assumption. Assignor does hereby assign to Assignee the Merrill Strip Easement and all of Assignor's right, title, interest and obligations in and to the Merrill Strip Easement, and Assignee accepts from Assignor all such right, title and interest, and hereby assumes all the obligations of Assignor under the Merrill Strip Easement.
2. Indemnification. Assignee hereby agrees to indemnify and hold Assignor harmless from and against any loss, cost, expense, damage, claim, action, cause of action, suit, or other liability (including reasonable attorneys' fees) incurred by Assignor which arises out of, or is based upon, a failure by Assignee to perform or fulfill any term, covenant, agreement, duty, responsibility or obligation of Assignee, as grantee under the Merrill Strip Easement.
3. Miscellaneous. This Assignment shall be binding upon and inure to the benefit of the parties hereto and their respective successors and permitted assigns. This Assignment may be signed in any number of counterparts with the same effect as if the signature on each such counterpart were upon the same instrument. This Assignment shall be governed by the laws of the State of Maine, without regard to conflicts of law principles, except as otherwise specified in the Merrill Strip Easement.

[SIGNATURE PAGE IMMEDIATELY FOLLOWS]

SIGNATURE PAGE

The parties have executed this Assignment on the day and year first above written.

ASSIGNOR:

CENTRAL MAINE POWER COMPANY

By: _____

Printed Name: _____

Its: _____

By: _____

Printed Name: _____

Its: _____

ASSIGNEE:

NECEC TRANSMISSION LLC

By: _____

Printed Name: _____

Its: _____

EXHIBIT D

Form of State of Maine Lease Assignment

ASSIGNMENT OF LEASE

THIS ASSIGNMENT OF LEASE AGREEMENT ("Assignment") is made as of as of ____ day of _____, _____, by and among by and among **Central Maine Power Company**, a Maine corporation with its principal place of business at 83 Edison Drive, Augusta, Maine (hereinafter called "Assignor") and **NECEC Transmission LLC**, a Delaware limited liability company, with its principal place of business at One City Center 5th Floor, Portland, Maine, 04101 ("Assignee").

WITNESSETH:

WHEREAS, Assignor is a party to a certain Amended and Restated Transmission Line Lease Agreement dated June 23, 2020 by and between the State of Maine, Department of Agriculture, Conservation and Forestry, Bureau of Parks and Lands (hereinafter called the "Lessor") and Central Maine Power Company and recorded in the Somerset County Registry of Deeds in Book 5562, Page 75 (the "Lease Agreement"). A copy of the Lease Agreement is attached hereto as Exhibit A.

WHEREAS, under the terms of the Lease Agreement, the Lessor has leased to Assignor, a non-exclusive lease and right to use of a portion of the West Forks Plantation and Johnson Mountain Township (T2 R6 BKP WKR) Maine Public Reserved Lands in Somerset County, Maine, being a three hundred (300) foot wide by approximately one mile long area located on a portion of the aforementioned Maine Public Reserved Lands.

WHEREAS, Assignor and Assignee wish to enter into this Assignment Agreement for the purpose of assigning Assignor's rights, title, interest and obligations under the Lease Agreement.

NOW, THEREFORE, in consideration of the mutual premises and covenants contained herein, the receipt and sufficiency of which are hereby expressly acknowledged, the parties hereto agree as follows:

1. Assignment and Assumption. Assignor does hereby assign to Assignee all of Assignor's right, title and interest in and to the Lease Agreement, and Assignee accepts from Assignor all such right, title and interest, and hereby assumes all the obligations of Assignor under the Lease Agreement.
2. Indemnification. Assignee hereby agrees to indemnify and hold Assignor harmless from and against any loss, cost, expense, damage, claim, action, cause of action, suit, or other liability (including reasonable attorneys' fees) incurred by Assignor which arises out of, or is based upon, a failure by Assignee to perform or fulfill any term, covenant, agreement, duty, responsibility or obligation of Assignee under the Lease Agreement.
3. Miscellaneous. This Assignment shall be binding upon and inure to the benefit of the parties hereto and their respective successors and assigns. This Assignment may be signed in any number of counterparts with the same effect as if the signature on each such counterpart were upon the same instrument. This Assignment shall be governed by the laws of the State of Maine, without regard to conflicts of law principles, except as otherwise specified in the Lease Agreement.

[SIGNATURE PAGE IMMEDIATELY FOLLOWS]

SIGNATURE PAGE

The parties have executed this Assignment on the day and year first above written.

ASSIGNOR:

CENTRAL MAINE POWER COMPANY

By: _____

Printed Name: _____

Its: _____

By: _____

Printed Name: _____

Its: _____

ASSIGNEE:

NECEC TRANSMISSION LLC

By: _____

Printed Name: _____

Its: _____

**AMENDED AND RESTATED
TRANSMISSION LINE LEASE****BETWEEN****DEPARTMENT OF AGRICULTURE, CONSERVATION AND
FORESTRY
BUREAU OF PARKS AND LANDS****and CENTRAL MAINE POWER COMPANY**

This Amended and Restated Transmission Line Lease ("Lease") is made by and between the State of Maine, Department of Agriculture, Conservation and Forestry, Bureau of Parks and Lands, (the "Lessor"), acting pursuant to 12 M.R.S. § 1852(4), and Central Maine Power Company, a Maine corporation with its principal place of business at 83 Edison Drive, Augusta, Maine (the "Lessee"). For the considerations hereinafter set forth, the Lessor hereby leases to Lessee, and Lessee hereby takes from the Lessor, the non-exclusive use of that portion of the West Forks Plantation and Johnson Mountain Township (T2 R6 BKP WKR) Public Reserved Lands in Somerset County, Maine described in Exhibit "A" and shown on Exhibit "B" attached hereto and incorporated herein, being a three hundred (300) foot wide transmission line corridor containing 32.39 acres and located on a portion of the aforementioned Public Reserved Lands. The described transmission line corridor, together with the improvements now or hereafter to be placed thereon, is referred to as the "Property" or "Premises," and is subject to the following terms and conditions:

1. Term:

- a. This Lease shall be in effect from the date of execution of this instrument for a term of twenty-five (25) years, which term expires on March 31, 2045.
- b. Lessor reserves the right to terminate this Lease at any time during the term hereof to the extent permitted under the provisions contained in paragraph 13 Default.
- c. Lessee has the right to terminate this Lease upon at least ninety (90) days prior written notice to Lessor, or such lesser notice period as agreed to by Lessor in writing.
- d. Any notice required by this paragraph, whether by Lessee or Lessor, shall be sent postage pre-paid, registered or certified mail, return receipt requested, to the party at the address set forth in paragraph 24.

2. Rent. Lessee shall pay to the Lessor rental as follows:

An annual payment of \$65,000.00. The first payment shall be due on the date of execution of this Lease (the "Initial Payment") and subsequent annual payments shall be made on or before April first of each following year. Lessee shall, within the first twelve months of this Lease, commission an appraisal of the Premises and of the fair market value of the annual rent for the Premises. Both Lessor and Lessee shall agree on the Appraiser to be assigned the appraisal assignment. In the event the appraised fair market value of the annual rent for the Premises is higher than the Initial Payment set forth above, then the parties shall amend this Lease to retroactively increase the Initial Payment due hereunder to the fair market value indicated by the appraisal. Lessee agrees to pay the cost of the appraisal.

The annual payment shall be adjusted each year in accordance with the increase in the Consumer Price Index as published by the Bureau of Labor Statistics, United States Department of Labor over the preceding one year period; provided, however, that in no event shall the annual payment for any given Lease year be less than the annual payment for any previous Lease year. As used herein, the "Consumer Price Index" means the Consumer Price Index for All Urban Consumers (CPI-U), All items in U.S. city average, all urban consumers, not seasonally adjusted, Base Period 1982-84=100. Such Index shall be adjusted as necessary to properly reflect all changes in the Base Period, using such conversion factors as may be available from the United States Government. In the event the Consumer Price Index shall not be published by the United States Government, the successor or substitute index published by the United States Government shall be used for the foregoing computation.

In addition, Lessee shall pay to Lessor the negotiated market price of the timber present on the Premises based on mill scale and stumpage value at time the corridor is harvested for the construction of the utility corridor.

3. Use. The Property shall be used by the Lessee as follows: to erect, construct, reconstruct, replace, remove, maintain, operate, repair, upgrade, and use poles, towers, wires, switches, and other above-ground structures and apparatus used or useful for the above-ground transmission of electricity ("Facilities"), all as the Lessee, its successors and assigns, may from time to time require upon, along, and across said Property; to enter upon the Property at any time with personnel and conveyances and all necessary tools and machinery to maintain the Premises and Facilities; the non-exclusive right of ingress to and egress from the Premises over and across roads and trails crossing the adjacent land of the Lessor, in accordance with paragraphs 5.a and 6.k below; to transmit electricity and communication, as conditioned below, over said wires, cables, or apparatus installed on Lessee's Facilities. All such use by Lessee shall be in compliance with the State of Maine Public Utilities Commission Order Granting Certificate of Public Convenience and Necessity and Approving Stipulation dated May 3, 2019 (Docket No. 2017-00232) (the "CPCN"). Lessee shall own all communication facilities and such facilities shall be for Lessee's use in its business as a public utility and Lessee may also provide communication facilities and services consistent with the Broadband Benefit set forth in the May 3, 2019 Stipulation approved as part of the CPCN. In the event Lessee desires to provide capacity to others on Lessee's communication facilities, Lessee shall first obtain Lessor's written approval, which shall not be unreasonably withheld. Lessor may adjust the rent at such

time as Lessee provides communication capacity to others. The rent adjustment is to be determined by an appraisal paid for by Lessee. Both Lessor and Lessee shall agree on the Appraiser to be assigned the appraisal assignment. Lessee shall engage the agreed upon Appraiser within ninety (90) days of said agreement. Lessee shall ensure that Lessor is provided with a copy of the appraisal within ten (10) days of receiving completed appraisal. Lessee shall not sub-lease or contract the communication facilities for any other commercial use. The Lessor further grants to said Lessee the right to establish any and all safety and reliability regulations applicable to said transmission line corridor which said Lessee deems necessary and proper for the safe and reliable construction and maintenance of said structures, wires, and apparatus and for the transmission of electricity.

4. Quiet Enjoyment. So long as Lessee pays the rent, performs all of its non-monetary obligations, and otherwise complies with the provisions of this Lease, the Lessee's possession of the Premises for its intended use will not be disturbed by the Lessor, its successors and assigns except as otherwise provided under the terms of this Lease. Notwithstanding any provision to the contrary herein, Lessor reserves the right to enter onto the Premises at any time and from time to time to inspect the Premises.

5 Access:

- a. It is agreed by the parties to this Lease that Lessor is under no obligation to construct or maintain access to the Premises, notwithstanding any provisions of any federal, state, and local law to the contrary. However, the Lessee shall be allowed to cross Lessor's abutting land by using Lessor's Forest Management Roads for access to the Premises for construction, maintenance, and repairs, subject to reasonable restrictions and regulations imposed by Lessor, and the rights of others using said roads. Upon reasonable advance notice to Lessee, Lessor reserves the right to close, lock, or otherwise restrict access along or through the Forest Management Roads at any time it appears reasonably necessary to protect the safety of persons or property. Such situations include, but are not limited to, spring mud season or periods of high fire danger. Lessee shall immediately repair to the Lessor's satisfaction any damage to the road caused by Lessee at Lessee's sole cost and expense. Lessor is under no obligation to provide maintenance to the road. If Lessee wishes to undertake performing repairs or upgrades to the Forest Management Roads, Lessee must acquire prior written approval from Lessor. Lessee shall acquire Lessor's prior written approval for the construction or use of any other access location across Lessor's land abutting the Premises.
- b. The Lessor expressly reserves the right for itself or its guests, servants, or agents to pass and repass over the described Premises at any and all times with machinery and equipment necessary for the operation or conduct of Lessor's uses as such uses may from time to time exist, provided that: said uses will comply with the above referenced safety regulations, and will not prohibit the Lessee from complying with the conditions or requirements imposed by permitting agencies; that the Lessor shall provide Lessee with at least three business days prior written notice if Lessor will be on the Premises with construction or logging equipment; and that such use will not unreasonably interfere with the rights of Lessee herein conveyed.

6. Lessee Covenants. The Lessee covenants as follows:

- a. No buildings, either permanent or temporary, may be constructed or placed upon the described Premises, except temporary structures during construction of the Facilities, such as field trailers.
- b. Crossing mats for stream or wetland crossings shall not be made of ash or hemlock, so as to avoid introduction of invasive pests associated with these species.
- c. No hazardous or toxic waste substance or material, residual pesticides or fertilizers, other than organic compost, shall be used or kept upon the Premises, nor shall any livestock or poultry be kept temporarily or permanently thereon. Pesticides, herbicides, and chemical defoliant registered for use in Maine may be applied to the Premises only after acquiring prior written approval from Lessor and only by trained applicators working under the supervision of applicators licensed by the State of Maine in formulations and dosages approved by the Environmental Protection Agency and Lessor. One month prior to all pesticide applications, Lessee shall provide information to Lessor, including, but not limited to pesticides, herbicides, and chemical defoliant to be used, dates and methods of application, application locations, and reasons for use.
- d. There shall be no vegetation removal that would result in less than 50% aerial coverage of woody vegetation and stream shading within 25 feet of a stream.
- e. There shall be no vegetation maintenance or disturbance within a 50-foot radius around the high water boundary of a significant vernal pool from March 15 – July 15; provided, however, that Lessee may take all appropriate actions with regards to vegetation management to ensure that Lessee is in compliance with all federal and state laws, rules, and regulations imposed upon Lessee as the owner and operator of the Facilities.
- f. Lessee shall not make any strip or waste of the Premises or of any other lands of Lessor. Vegetation clearing within the Premises for Lessee's Facilities shall be limited to standards approved by the Maine Public Utilities Commission and shall encourage a ground cover of woody species with a maximum mature height approaching but not exceeding 15 feet. Lessee shall make every effort to minimize clearings and cutting of vegetation.
- g. Lessee acknowledges that lease of the Premises by the Bureau of Parks and Lands, Department of Agriculture, Conservation and Forestry is unique, and that in authorizing the Lease under 12 M.R.S. § 1852(4)(A), Lessor requires that Lessee shall make every reasonable effort within the Premises to be in conformance with the Maine Department of Inland Fisheries and Wildlife "Recommended Performance Standards for Inland Waterfowl and Wadingbird Habitats in Overhead Utility ROW Projects", "Recommended Performance Standards for Maine's Significant Vernal Pools in Overhead Utility ROW Projects", "Recommended Performance Standards for Riparian Buffers in Overhead Utility ROW Projects", and "Recommended Performance Standards for Deer Wintering Areas in Overhead Utility ROW

Projects", all dated March 26, 2012, copies of which are attached to this Lease, or the publication's most current version.

- h. Lessee shall not kindle any outside fires on the Premises or any other land of the Lessor. Lessee agrees to assist with any means at Lessee's disposal in putting out fires occurring on the Premises or adjacent areas, and to report promptly such fires to Lessor or the manager of the Bureau's Western Public Lands Office and to the appropriate authorities.
- i. Lessee agrees to maintain the Premises in a neat and sanitary manner and so as not to be objectionable or detract from the aesthetic values of the general area. Lessee shall not discharge on the Premises, including into any body of water, wetland, or groundwater, any untreated or partially treated sewage, wash water, black water, gray water, or slop water. No non-forest waste including, but not limited to, broken equipment, spilt fuels, fluids and lubricants, fluid and lubricant containers, equipment parts, tires, debris, garbage, or trash shall be deposited, discharged, dumped, or buried upon the Premises or other property of Lessor. In addition, Lessee covenants that it bears the responsibility for any noncompliance with all federal, state, and local laws and regulations governing septic and other waste disposal resulting from Lessee's activities and Lessee shall indemnify and hold harmless Lessor from and against any and all actions, suits, damages, and claims by any party by reason of noncompliance by Lessee with such laws and regulations. Such indemnification shall include all Lessor's costs, including, but not limited to reasonable attorney fees.
- j. Forest woody waste (e.g., wood chips and stumps) may be disposed of on the Premises, but may not be disposed of in piles. Stumps shall be buried in "stump dump" holes, except that small numbers of stumps (four or less) may be left aboveground.
- k. Lessee shall not build permanent roads on the Premises without obtaining prior written approval from the Lessor; provided, however, that Lessee may construct one (1) temporary road to facilitate the construction of the transmission line (tree clearing, pole setting, wiring) substantially in the location depicted in Exhibits "C-1", "C-2" and "C-3" attached hereto and incorporated herein. At the time construction is completed, the temporary road shall be dismantled and put to bed or converted to permanent access trails. All access trails shall be built to Best Management Practices (BMP) standards as shown in the "Maine Motorized Trail Construction and Maintenance Manual" written by the Bureau of Parks and Lands Off-Road Vehicle Division, dated May 2011 and all roads shall be built pursuant to those Best Management Practices (BMPs) standards pertaining to forest management and road construction practices set forth in the publication entitled, "Best Management Practices for Forestry: Protecting Maine's Water Quality," prepared by the Maine Department of Agriculture, Conservation and Forestry, Maine Forest Service, in such publication's most current version at the time of the grant of this Lease, and as the same may be further amended, supplemented or replaced after the date of the execution of this Lease.

Prior to start of construction, Lessee shall provide an Access and Maintenance Plan to Lessor for review and approval. This plan shall provide details and maps on

proposed roads, permanent and temporary, access points, temporary trails, and maintenance access, and descriptions of any proposed bridges, temporary or permanent.

- l. Natural Plant Community, wetland and Significant Vernal Pool field surveys of the Premises must be conducted by Lessee or Lessee's designee prior to any construction on the Premises. Lessee shall send to Lessor and to the Maine Department of Inland Fisheries and Wildlife a copy of all completed surveys before commencing any construction on the Premises.
- m. Lessee shall be in compliance with all Federal, State and local statutes, ordinances, rules, and regulations, now or hereinafter enacted which may be applicable to Lessee in connection to its use of the Premises. Lessee further shall not construct, alter, or operate the described Premises in any way until all necessary permits and licenses have been obtained for such construction, alteration or operation. Lessee shall provide written confirmation that Lessee has obtained all material permits and licenses to construct and operate the Facilities. Lessee shall furnish Lessor with copies of all such permits and licenses, together with renewals thereof to Lessor upon the written request of Lessor. This Lease shall terminate at the discretion of the Lessor for failure of Lessee to obtain all such required permits. Prior to such termination, however, Lessor shall provide written notice to Lessee of such failure and Lessee shall have 30 days in which to cure such failure.
- n. In the event of the following:
 - a) Lessee constructs an electric transmission line on the Premises; and
 - b) Lessee has determined, in its sole discretion, to rebuild the existing transmission line (the "Jackman Tie Line") located on that part of the existing 100-foot wide utility corridor described in a lease dated July 9, 1963 and recorded in the Somerset County Registry of Deeds, Book 679, Page 37 (the "Jackman Tie Line Lease") that is located westerly of the Premises and easterly of Route 201; and
 - c) Lessee receives all permits and regulatory approvals necessary to rebuild the line in such new location including, but not limited to, approvals of the Maine Public Utilities Commission and the Maine Department of Environmental Protection; then

Lessee agrees to relocate said Jackman Tie Line from the above described portion of the Jackman Tie Line Lease to a location on the Premises and such other corridor as acquired by the Lessee from others. Upon completion of any such relocation of the Jackman Tie Line or its functional replacement pursuant to this section and removal of Lessee's facilities from that portion of the Jackman Tie Line Lease lying westerly of the Premises, Lessor and Lessee agree to amend the Jackman Tie Line Lease to delete from the lease area that portion of the Jackman Tie Line Lease lying westerly of the Premises. All other terms and conditions of the Jackman Tie Line Lease shall remain in full force and effect. The term "rebuild" as used in this paragraph, shall not include routine repair or replacement of poles, crossarms, insulators, braces or conductor.

7. Liability and Insurance.

a. Lessee shall without unreasonable delay inform Lessor of all risks, hazards, and dangerous conditions caused by Lessee which are outside of the normal scope of constructing and operating the Facilities of which Lessee becomes aware with regards to the Premises. Lessee assumes full control of the Premises, except as is reserved by Lessor herein, and is responsible for all risks, hazards, and conditions on the Premises caused by Lessee.

b. Except for the conduct of Lessor and Lessor's guests and agents, Lessor shall not be liable to Lessee for any injury or harm to any person, including Lessee, occurring in or on the Premises or for any injury or damage to the Premises, to any property of the Lessee, or to any property of any third person or entity. Lessee shall indemnify and defend and hold and save Lessor harmless, including, but not limited to costs and attorney fees, from: (a) any and all suits, claims, and demands of any kind or nature, by and on behalf of any person or entity, arising out of or based upon any incident, occurrence, injury, or damage which shall or may happen in or on the Premises that is caused by the Lessee or its Agents; and (b) any matter or thing arising out of the condition, maintenance, repair, alteration, use, occupation, or operation of the Premises, the installation of any property thereon or the removal of any property therefrom that is done by the Lessee or its Agents. Lessee shall further indemnify Lessor against all actions, suits, damages, and claims by whoever brought or made by reason of the nonobservance or nonperformance of Lessee or its Agents of: (a) any obligation under this Lease; or (b) any federal, state, local law or regulation pertaining to Lessee's use of the Premises.

c. The Lessee shall obtain and keep in force, for the duration of this Lease, a liability policy issued by a company fully licensed or designated as an eligible surplus line insurer to do business in this State by the Maine Department of Professional & Financial Regulation, Bureau of Insurance, which policy includes the activity to be covered by this Lease with adequate liability coverage over at least one million dollars for each occurrence and two million dollars in annual aggregate in general commercial liability coverage to protect the Lessee from suits for bodily injury and damage to property. Nothing in this provision, however, is intended to waive the immunity of the Lessor. Upon execution of this Lease, the Lessee shall furnish the Lessor with a certificate of insurance as verification of the existence of such liability insurance policy.

8. Lessee's Liability for Damages. Lessee shall be responsible to Lessor for any damages caused directly or indirectly by Lessee or its guests, servants, or agents, including, but not limited to, interference or meddling with any tools, machinery, equipment, gates, buildings, furniture, provisions, or other property of the Lessor, its agents, employees, or guests on the Premises.

9. Tax Proration. Lessee shall pay when due all taxes levied on the personal property and improvements constructed by Lessee and located on the Premises. Lessor shall have no ownership or other interest in any of the Facilities on the Property.

10. Lease Assignment, Sublease, and Colocation: Lessee shall not assign or sublease in whole or part without prior written consent of Lessor, which consent shall not be unreasonably withheld. Lessor may lease the Premises for other compatible uses and colocation of other utilities so long as such rights do not extend to access to the Facilities, said uses will not prohibit the Lessee from complying with the conditions or requirements imposed by permitting agencies, and such use will not interfere with the rights herein conveyed, including the right to build such additional Facilities as may be accommodated on the Premises using transmission line spacing standards approved by the Maine Public Utilities Commission. Notwithstanding the forgoing, Lessee may assign its interest in this Lease to NECEC Transmission LLC, a Delaware limited liability company ("NECEC") without Lessor consent, so long as Lessee gives written notice of such assignment to Lessor, together with a copy of the executed assignment, and so long as the assignment expressly provides that NECEC has assumed all of the Lessee's obligations under this Lease. Upon delivery of such notice and such executed assignment, Central Maine Power Company shall be released from any obligations under this Lease from and after the effective date of such assignment. NECEC is related to Lessee and under common ownership with Lessee.
11. Lessee's Removal of Structures: Lessee must obtain Lessor's advance written consent, which consent shall not be unreasonably withheld, delayed, or conditioned, to the method and timing of removal before any structures or improvements are removed from the Premises.
12. Surrender. Upon termination of this Lease for any reason, Lessee shall deliver the Premises to Lessor peaceably, without demand, and in reasonably good condition clear of all trash and debris, unusable equipment, unregistered vehicles, and abandoned equipment and structures, located on the Premises. If such trash and debris and other unusable equipment, unregistered vehicles, and abandoned equipment and structures are not removed within one hundred eighty days (180) days of the termination of this Lease, the Lessor shall thereafter have the right to remove it and Lessee shall reimburse Lessor for the costs of such removal and disposal. Any other personal property, fixture, or structure on the Premises belonging to Lessee shall be removed by Lessee, unless Lessor requests in writing, that the other personal property, fixture, or structure may remain and Lessee agrees in writing not to remove it. If the Lessee fails to remove such other personal property, fixture, or structure such items shall be deemed the property of the Lessor two hundred and ten days (210) days after termination of the Lease and the Lessor shall thereafter have the right to remove it and charge the Lessee with the costs of such removal and disposal. In the event that any of this other personal property, fixtures, or structures on the Premises are incapable of being removed within one hundred eighty days (180) days, Lessee may be allotted up to one year to remove the items, with prior written approval from Lessor, which approval shall not be unreasonably, delayed, or conditioned. Any holding over by Lessee without Lessor's prior written consent shall be considered a tenancy at sufferance.
13. Default.
- a. The following constitutes a default under this Lease: (1) Lessee's failure to perform any of its monetary or nonmonetary obligations under this Lease; (2) the filing of any bankruptcy or insolvency petition by or against Lessee or if Lessee makes a general assignment for the benefit of creditors which is not resolved or withdrawn within 30

days of such petition being filed; (3) an execution, lien, or attachment issued against the Lease, the Premises, or Lessee's property on the Premises, unless Lessee provides Lessor with satisfactory assurances and evidence that such execution, lien, or attachment will be released within a reasonable time not to exceed thirty (30) days, unless a shorter period of time is provided for by any applicable law or proceeding for the removal thereof, in which case the more restrictive time limitation applies; (4) the assignment or sublease of this Lease to any third party other than as permitted pursuant to Section 10 above; or (5) the violation of any state, federal or local law, rule, regulation, or ordinance; or (6) Lessee's abandonment of the Premises.

b. Upon the occurrence of any such event of default and subject to any applicable cure period as defined in paragraph 6(m), above, Lessor may, in addition to (and not instead of) any other remedies available at law or in equity, terminate this Lease with notice or demand to Lessee and enter and take possession of the leased Premises. Lessee shall be liable to Lessor for loss and expense, including reasonable attorney fees, incurred by reason of such default or termination hereof Lessor will provide Lessee with written notice of an event or occurrence of default under paragraph 13(a)(1) and Lessee shall have a reasonable period of time, as determined by Lessor, to cure said default which period shall not exceed thirty (30) days; provided, however, that if Lessee satisfies to Lessor that Lessee has undertaken the appropriate actions to cure said default and such default has not been cured within the said time permitted, the Lessor may exercise its sole discretion to extend the cure period.

14. Statutory Authority Over Public Lands. Lessor shall have the right to request that this Lease be amended from time to time and throughout the term of this Lease if any Lease term is found not to comply with Maine state law regarding public reserved lands. Lessor shall send notice to Lessee of the proposed revision. Upon receipt of such notice, Lessee shall have the option to either terminate the Lease by notifying Lessor in writing within thirty (30) days of receipt of notice or negotiate an amendment to the Lease in order to bring such term in compliance with said state law. Except as provided in this Lease, neither Party shall have the right to terminate this Lease unless the resulting non-compliance constitutes a default under Section 13 hereof, in which case Section 13 shall govern.
15. Mechanics Lien. If any notice is filed at the county registry of deeds of a builder's, supplier's or mechanic's lien on the Premises, arising out of any work performed by or on behalf of Lessee, Lessee shall cause such lien to be discharged or released immediately and shall indemnify Lessor against any such claim or lien, including all costs and attorney fees that Lessor may incur in connection with the same.
16. Succession; No Partnership. This Lease shall be binding upon and inure to the benefit of the heirs, executors, administrators, successors in interest, and assigns of the parties hereto. Nothing in this agreement shall be construed to create an association, joint venture, trust or partnership covenant, obligation, or liability on or with regards to any of the parties to this agreement.
17. Waiver. Any consent, express or implied, by Lessor to any breach by Lessee of any covenant or condition of this Lease shall not constitute a waiver by the Lessor of any prior or succeeding breach by Lessee of the same or any other covenant or condition of this Lease.

Acceptance by Lessor of rent or other payment with knowledge of a breach or default by Lessee under any term on this Lease shall not constitute a waiver by Lessor of such breach or default.

18. Force Majeure. Except as expressly provided herein, there shall be no abatement, diminution, or reduction of the rent or other charges payable by Lessee hereunder, based upon any act of God, any act of the enemy, governmental action, or other casualty, cause, or happening beyond the control of the parties hereto.
19. Eminent Domain. In the event that the Premises or any portion thereof shall be lawfully condemned or taken by any public authority, Lessor may, in its discretion, elect either: (a) to terminate the Lease; or (b) to allow this Lease to continue in effect in accordance with its terms, provided, however, that a portion of the rent shall abate equal to the proportion of the Premises so condemned or taken. All condemnation proceeds shall be Lessor's sole property without any offset for Lessee's interests hereunder.
20. Holding Over. If Lessee holds over after the termination of this Lease, said hold over shall be deemed to be a trespass.
21. Lessor Protection. Lessor expressly retains and nothing contained herein shall be construed as a release or limitation by Lessor of any and all applicable liability protections under Maine law. Lessor specifically retains any and all protections provided under Maine law to owners of land, including but not limited to those provided under the Maine Tort Claims Act, 14 M.R.S. §§ 8101-8118.
22. Cumulative Remedies. The remedies provided Lessor by this Lease are not exclusive of other remedies available by current or later existing laws.
23. Entire Agreement; Supersedes 2014 Lease. This Lease sets forth all of the covenants, promises, agreements, conditions, and understandings between Lessor and Lessee governing the Premises. There are no covenants, promises, agreements, conditions, and understandings, either oral or written, between them other than those herein set forth. Except as herein provided, no subsequent alterations, amendments, changes, or additions to this Lease shall be binding upon the Lessor or Lessee unless and until reduced to writing and signed by both parties. This Lease supersedes the Transmission Line Lease between Lessor and Lessee dated December 15, 2014, as amended by Lease Amendment dated June 22, 2015 (as amended, the "2014 Lease"), and the parties acknowledge that the 2014 Lease is terminated as of the effective date of this Lease.
24. Notices. All notice, demands, and other communications required hereunder shall be in writing and shall be given by first class mail, postage prepaid, registered or certified mail, return receipt requested; if addressed to Lessor, to:

State of Maine, Department of Agriculture, Conservation and Forestry, Bureau of
Parks and Lands,
22 State House Station, Augusta, ME 04333-0022, Attn: Director;

and if to Lessee, to;

Central Maine Power Company, Real Estate Services
83 Edison Drive, Augusta, Maine 04364, Attn. Supervisor, Real Estate

25. General Provisions:

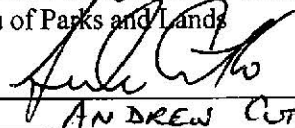
- a. Governing Law. This Lease shall be construed and interpreted in accordance with the laws of the State of Maine.
- b. Savings Clause. The invalidity or unenforceability of any provision of this Lease shall not affect or impair the validity of any other provision. To the extent any provision of this Lease is inconsistent with applicable state statute, the statute is deemed to govern.
- c. Paragraph Headings. The paragraph titles herein are for convenience only and do not define, limit, or construe the contents of such paragraph.

IN WITNESS WHEREOF, the parties have hereunto set their hands on the dates set forth below.
For purposes of this Lease, an electronic signature shall be deemed an original.

Lessor:

STATE OF MAINE

Department of Agriculture, Conservation, and Forestry
Bureau of Parks and Lands

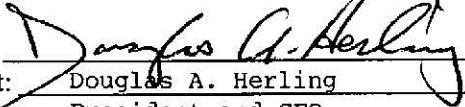
By: 
Print: ANDREW CUTKO
Its: DIRECTOR

Dated: JUNE 23, 2020


Witness

Lessee:

CENTRAL MAINE POWER COMPANY

By: 
Print: Douglas A. Herling
Its: President and CEO

Dated: June 15, 2020


Witness

EXHIBIT A**Leased Premises**

**Department of Agriculture, Conservation and Forestry
Bureau of Parks and Lands and
Central Maine Power Company**

A non-exclusive lease over a portion of the Lessor's land located in Johnson Mountain Township (T2 R6 BKP WKR), and West Forks Plantation, Somerset County, Maine, more particularly described as follows:

A strip of land 300 feet in width beginning at the southerly line of the Maine Public Reserved Lot located on the northerly line of West Forks Plantation at a ¾" iron rebar that is the northwest corner of an easement conveyed by Weyerhaeuser Company to Central Maine Power Company in a deed dated November 17, 2016 and recorded in the Somerset County Registry of Deeds in Book 5099, Page 247;

thence N 17°-05'29" W across the land of the Lessor a distance of 4702.99 feet, more or less, to a ¾" iron rebar on the northerly line of the Maine Public Reserved Lot located in Johnson Mountain Twp., said iron rebar also being the southwesterly corner of an easement conveyed to Central Maine Power Company by Weyerhaeuser Company in a deed dated November 17, 2016 and recorded in said Registry in Book 5099, Page 237;

thence N 78°-58'-32" E along the north line of said Johnson Mountain Twp. Public Lot a distance of 301.69 feet, more or less, to a ¾" iron rebar at the southeast corner of said easement described in Book 5099, Page 237;

thence S 17°-05'29" E across land of the Lessor a distance of 4702.81 feet, more or less, to a ¾" iron rebar at the southerly line of said West Forks Plantation Public Lot and the northeast corner of said easement described in Book 5099, Page 247;

thence S 78°-56'32" W along the southerly line of said West Forks Plantation Public Lot a distance of 301.67 feet, more or less, to the point of beginning, said lease area containing 32.39 acres, more or less.

Bearings are referenced to Grid North, Maine West Zone. For reference, see a survey by Sackett & Brake Survey, Inc. #2020076, dated March 23, 2020, to be recorded in said Registry.

All above referenced iron rebars are capped with a red plastic cap inscribed "S.W. Gould PLS 2318".

4491

Doc 7159 BK 5542 Pg 88

EXHIBIT B
Leased Premises
(Survey Plan dated March 23, 2020)

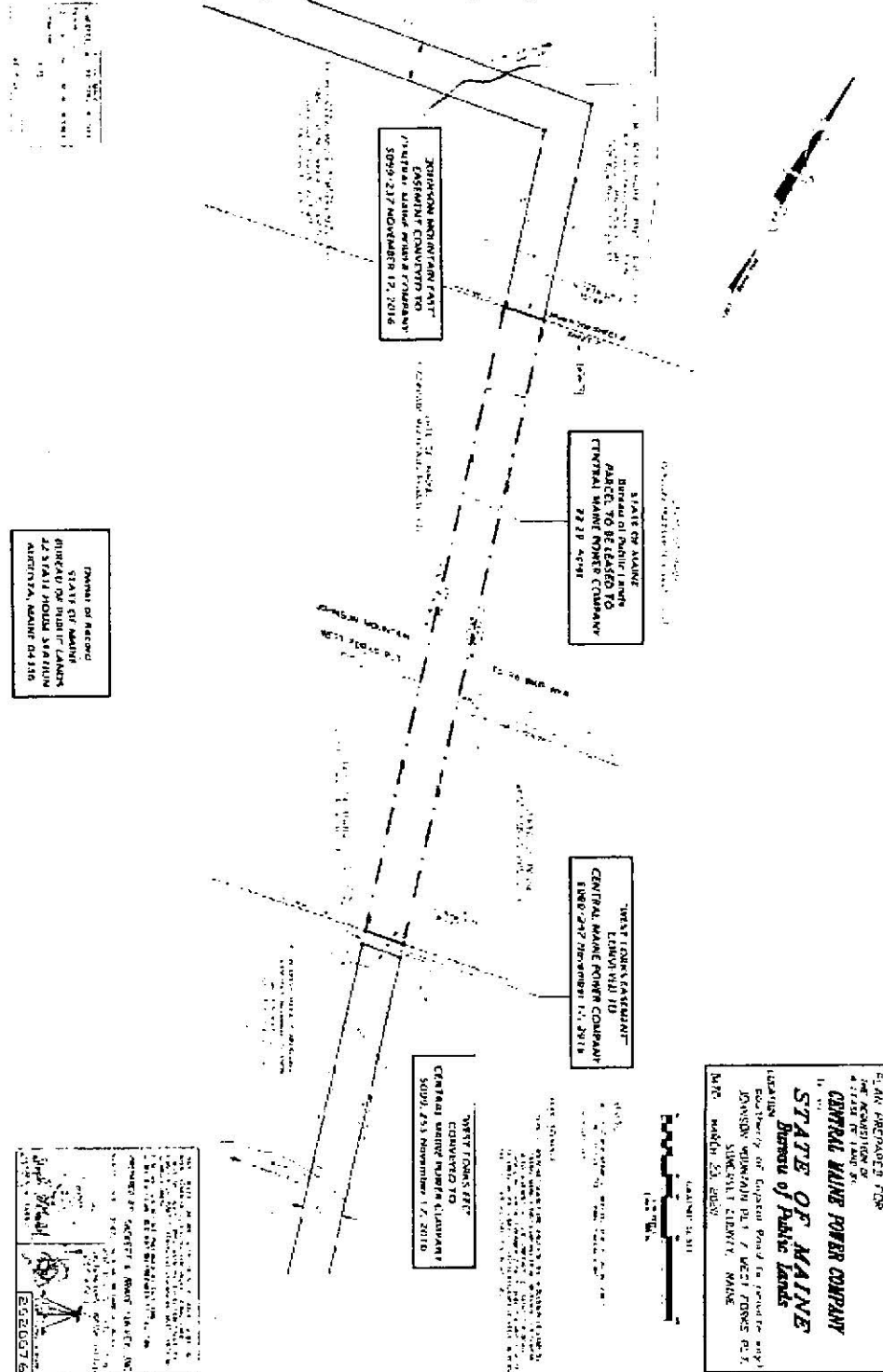


EXHIBIT C-1
Temporary Road Location

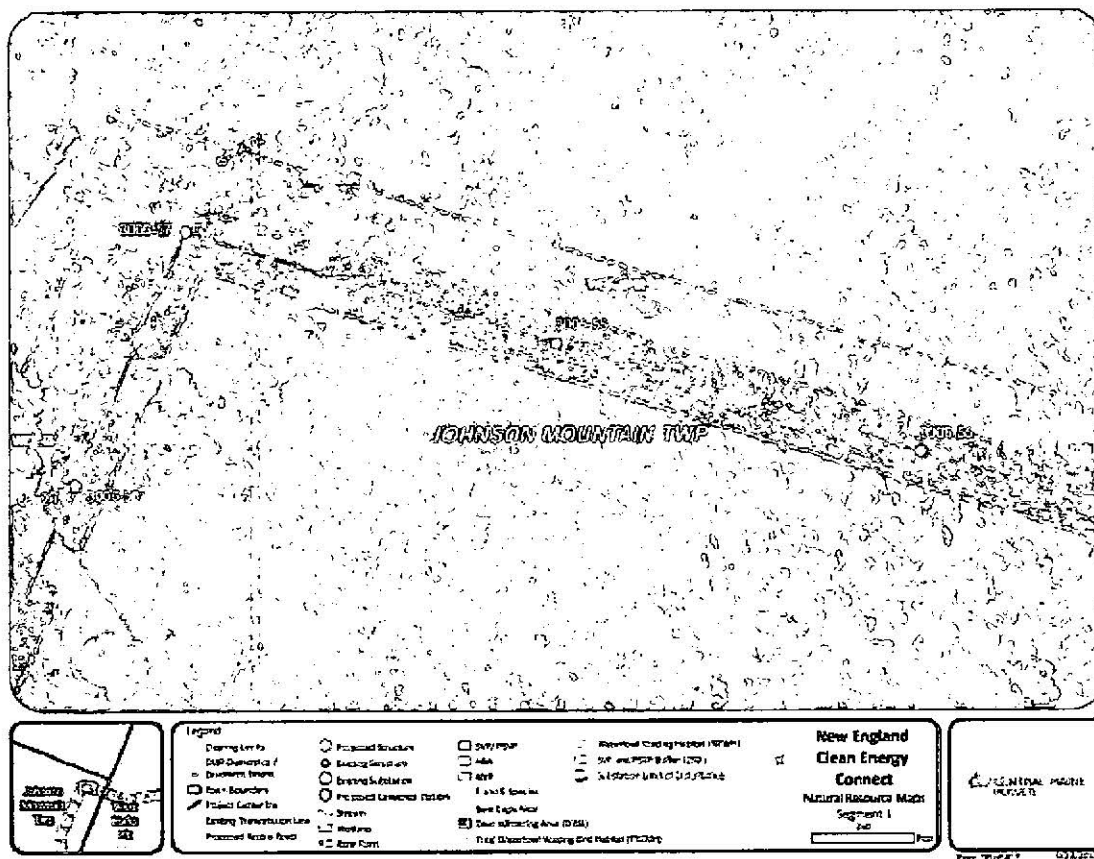
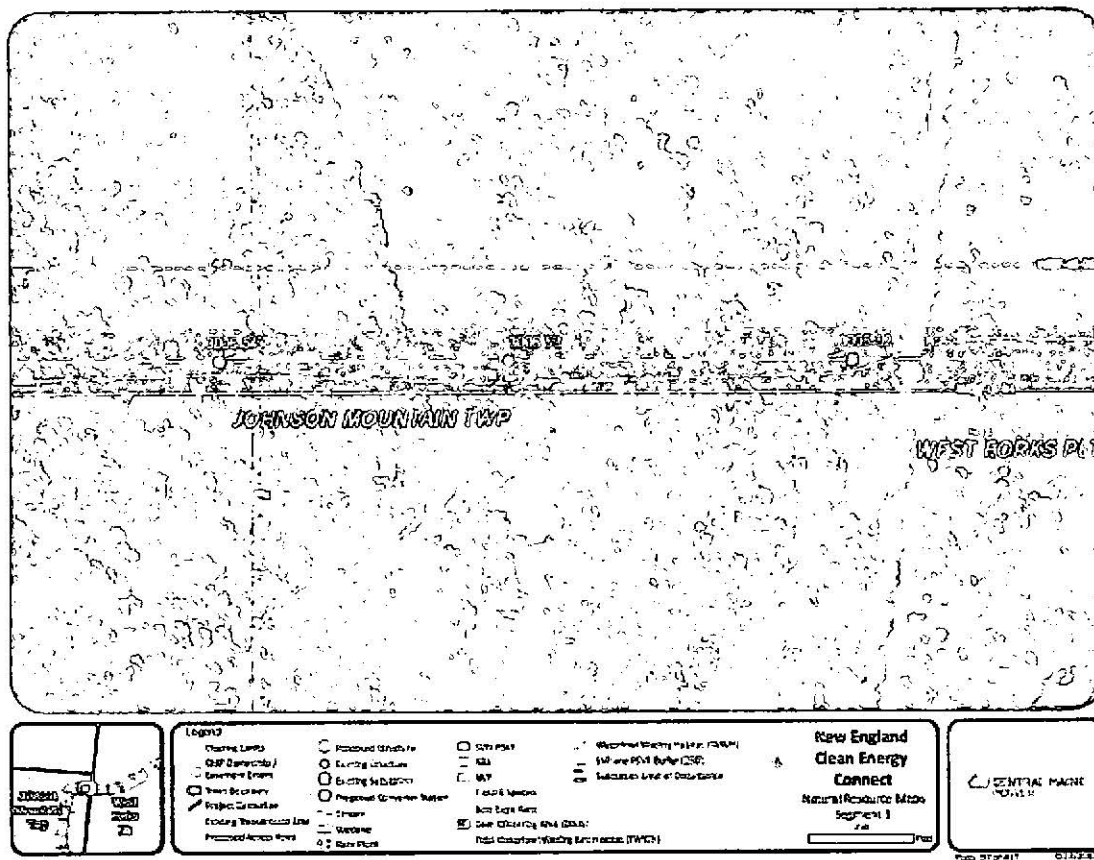


EXHIBIT C-2
Temporary Road Location



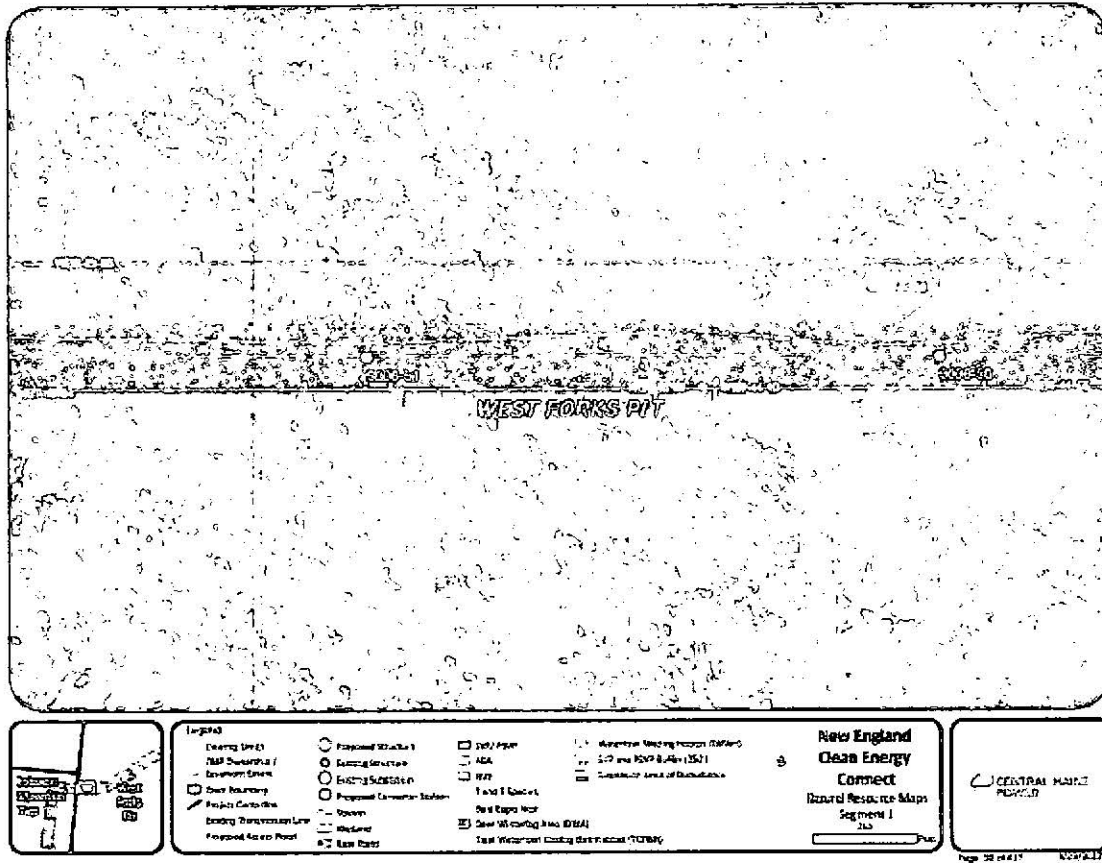
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EXHIBIT C-3
Temporary Road Location



ADDITIONAL ATTACHMENTS:

- Recommended Performance Standards for Inland Waterfowl and Wadingbird Habitats in Overhead Utility ROW Projects
- Recommended Performance Standards for Maine's Significant Vernal Pools in Overhead Utility ROW Projects
- Recommended Performance Standards for Riparian Buffers in Overhead Utility ROW Projects
- Recommended Performance Standards for Deer Wintering Areas in Overhead Utility ROW Projects

EXHIBIT E

Compensation Land

<u>Parcel</u>	<u>County</u>	<u>Township</u>	<u>Book</u>	<u>Page</u>
Flagstaff Lake	Somerset	Flagstaff	480	397
			480	265
			457	457
			453	431
Pooler Pond	Somerset	The Forks	631	384
			387	295
			391	291
Lower Enchanted	Somerset	Lower Enchanted	373	250
			2165	339
(access easement)			2165	348
Grand Falls	Somerset	T3 R4 BKP WKR (Spring Lake)	396	127
			397	483
			396	129
			394	555
			397	145
			397	593
			401	61
			401	03
			387	529
			389	564
			397	492
			396	128
			387	437
			396	133
(access easement)			5373	1
Little Jimmie-Harwood Pond	Kennebec	Manchester	10775	49
			11147	275
			10488	209
Basin Tract	Somerset	Pierce Pond	413	221
			391	110
			418	131

(access agreement)			5373	1
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EXHIBIT F

AT Relocation Land

<u>Parcel</u>	<u>County</u>	<u>Township</u>	<u>Book</u>	<u>Page</u>
1609 Troutdale Road	Somerset	Bald Mountain Twp. T2 R3 BKP EKR	5422	304

EXHIBIT G

Converter Station Access Land Deeds

<u>Parcel</u>	<u>County</u>	<u>Township</u>	<u>Book</u>	<u>Page</u>
Map 137, Lot 15	Androscoggin	Lewiston		
Part of Map 137, Lot 7	Androscoggin	Lewiston		

EXHIBIT H

Other Compensation Real Estate

All or part of the following parcels:

<u>Parcel</u>	<u>County</u>	<u>Township</u>	<u>Book</u>	<u>Page</u>
The Forks 8/11	Somerset	The Forks	820	865
			389	201
			820	865
The Forks 11/2	Somerset	The Forks	380	510
The Forks 11/9	Somerset	The Forks	536	177
			539	449
			541	538
Carry Brook	Somerset	Moxie Gore	1921	327
Moxie Stream Lower	Somerset	Moxie Gore	536	131
			536	138
			536	135
			536	141
Squaretown	Somerset	Squaretown	1932	248
			539	99
			434	89
Indian Stream	Somerset	Indian Stream	1932	248
			539	99
			434	89

EXHIBIT I-1

List of Third Party Vendor Agreements

(to be updated at the time of the Contract Date)

- (a) Program Management Services for the New England Clean Energy Connect Agreement dated September 18th, 2018 between CMP and Black & Veatch Corporation;
- (b) Amended & Restated Agreement for Transmission Line Design Services Agreement dated September 5th, 2018 between CMP and TRC Engineers, LLC;
- (c) CMP agreements and contractual arrangements related to the NECEC with the following third parties:
 - 1. BURNS & MCDONNELL
 - 2. ENGINEERING LEADERS INC
 - 3. HVDC TECHNOLOGIES LIMITED
 - 4. DIRIGO PARTNERS LTD
 - 5. SUBSTATION ENGINEERING CO
 - 6. TETRA TECH INC
 - 7. BOYLE ASSOCIATES
 - 8. S.W. COLE ENGINEERING INC
 - 9. COMPREHENSIVE LAND TECHNOLOGIES INC
 - 10. BLACK & VEATCH CORPORATION
 - 11. TRC ENGINEERS LLC
 - 12. REALTIME UTILITY ENGINEERS INC
 - 13. RYAN D WALLACE
 - 14. COUTTS BROTHERS INC
 - 15. V & S SCHULER ENGINEERING INC
 - 16. SACKETT & BRAKE SURVEY INC
 - 17. TERRENCE J DEWAN
 - 18. SEARCH INC
 - 19. POWER ENGINEERS INC
 - 20. GILMAN & BRIGGS ENVIRONMENTAL
 - 21. NEW ENGLAND GEODESIGN
 - 22. FLYCATCHER LLC
 - 23. ENVIRONMENTAL PERMITTING & INSPECTION

EXHIBIT I-2

List of NECEC Miscellaneous Agreements

(to be updated at the time of the Contract Date)

At Closing, CMP shall assign or otherwise convey to the Project Entity, and the Project Entity shall assume and accept, the rights and obligations under:

- (a) Joint Development Agreement dated January 23, 2019 between CMP and Hydro-Quebec Transénergie;
- (b) Memorandum of Understanding dated January 23, 2019 between CMP and H.Q. Energy Services (U.S.) Inc.;
- (c) Memorandum of Understanding dated June 13, 2018 between CMP and The Low Income Energy Affordability Network (LEAN);
- (d) Collaboration and Master Funding Agreement dated September 20, 2019 between CMP and the University of Massachusetts on behalf of its Lowell campus (“UMass”); and
- (e) Memorandum of Agreement between the U.S. Army Corps of Engineers, the U.S. Department of Energy, the U.S. Department of Interior, National Park Service, CMP and the Maine State Historic Preservation Officer regarding the NECEC dated on or about June 19, 2020.

At Closing, Project Entity will become a party and assume some of CMP’s rights and obligations under:

- (a) Memorandum of Understanding dated May 30, 2018 between CMP and Western Mountains & Rivers Corporation (“WM&RC MOU”) including the February 28, 2019 Amendment to the WM&RC MOU;
- (b) Memorandum of Understanding dated January 30, 2019 between CMP and Conservation Law Foundation and Acadia Center; and
- (c) Letter with Maine Appalachian Trail Club and the Appalachian Trail Conservancy dated on or about April 6, 2020.

EXHIBIT J

Form of Service Agreement

**SERVICE AGREEMENT BETWEEN
CENTRAL MAINE POWER COMPANY
AND
NECEC TRANSMISSION LLC**

This Service Agreement (this “Agreement”) is made and entered into this _____ day of _____, _____ by and between Central Maine Power Company (“**Provider Company**”) and NECEC Transmission LLC (“**Client Company**”), respectively identified on the signature page herein. Provider Company and Client Company may be referred herein individually as a “**Party**” and collectively as “**Parties**”.

WITNESSETH

WHEREAS, the Provider Company and the Client Company are wholly owned subsidiary companies of Avangrid, Inc. (“**Avangrid**”).

WHEREAS, Avangrid is integrated into the group of companies controlled by Iberdrola, S.A. (“**IBE**”) and, as a result, is a “controlled company” within the meaning of the New York Stock Exchange (“**NYSE**”) rules. IBE is the controlling shareholder of Avangrid and its subsidiaries (collectively, the “**Avangrid Group**”) and the relationship between IBE and the Avangrid Group is subject to U.S. laws, regulations, rules and standards applicable to U.S. publicly traded companies (e.g. Securities and Exchange Commission (“**SEC**”) regulations, requirements pursuant to the Sarbanes-Oxley Act, NYSE listing standards, etc.). Consistent with IBE’s Corporate Governance System, Avangrid operates under a framework of strengthened autonomy due to its status as a publicly listed company;

WHEREAS, Avangrid initially received authorization for intercompany service agreements from the SEC in accordance with the requirements of Section 13(b) of the Public Utility Holding Company Act of 1935 (“**35 Act**”);

WHEREAS, the Energy Policy Act of 2005 (“**EPAct 2005**”) repealed the 35 Act and the intercompany services agreements are now in accordance with applicable provisions of EPAct 2005, including but not limited to the Public Utility Holding Company Act of 2005 and the regulations of the Federal Energy Regulatory Commission (“**FERC**”); and

WHEREAS, Provider Company and Client Company have entered into this Agreement whereby Provider Company agrees to provide and Client Company agrees to accept and pay for various services as provided herein at cost, with cost determined in accordance with applicable rules and regulations, which require Provider Company to fairly and equitably allocate costs among all affiliate companies to which it renders services (collectively, the “**Client Companies**”), including Client Company.

NOW THEREFORE, in consideration of the premises and the mutual agreements herein contained, the Parties to this Agreement agree as follows:

ARTICLE I - SERVICES

Section 1.1 Provider Company shall furnish to Client Company, as requested by Client Company, upon the terms and conditions hereinafter set forth, such of the services described in Appendix A hereto, at such times, for such periods and in such manner as Client Company may from time to time request and that Provider Company concludes it is able to perform. Provider Company shall also provide Client Company with special services, so long as such services do not materially add to those services described in Appendix A hereto, as may be requested by Client Company and that Provider Company concludes it is able to perform. In supplying such services, Provider Company may arrange, where it deems appropriate, for the services of such experts, consultants, advisers, and other persons with necessary qualifications as are required for or pertinent to the provision of such services.

Section 1.2 Client Company shall take from Provider Company such of the services described in Appendix A, and such additional special services, as limited by Section 1.1 hereof, as are requested from time to time by Client Company and that Provider Company concludes it is able to perform.

Section 1.3 The cost of the services described herein or contemplated to be performed hereunder shall be directly assigned, distributed or allocated by activity, project, program, internal order or other appropriate basis. Client Company shall have the right from time to time to amend or alter any activity, project, program or internal order provided that (i) any such amendment or alteration that results in a material change in the scope of the services to be performed or equipment to be provided is agreed to by Provider Company, (ii) the cost for the services covered by the activity, project, program or internal order shall include any expense incurred by Provider Company as a direct result of such amendment or alteration of the activity, project, program or internal order, and (iii) no amendment or alteration of an activity, project, program or internal order shall release Client Company from liability for all costs already incurred by or contracted for by Provider Company pursuant to the activity, project, program or internal order, regardless of whether the services associated with such costs have been completed.

Section 1.4 Provider Company shall use its best efforts to maintain a staff trained and experienced in the services described in Appendix A.

ARTICLE II - COMPENSATION

Section 2.1 As compensation for the services to be rendered hereunder, Client Company shall pay to Provider Company all costs that reasonably can be identified and related to particular services performed by Provider Company for or on its behalf. The methods for

assigning or allocating Provider Company costs to Client Company, as well as to other affiliate companies, are set forth in Appendix A.

Section 2.2 It is the intent of this Agreement that charges for services shall be distributed among Client Companies, to the extent possible, based upon direct assignment. The amounts remaining after direct assignment shall be allocated among the Client Companies using the methods identified in Appendix A. The method of assignment or allocation of cost shall be subject to review by the Provider Company annually, or more frequently if appropriate. Such method of assignment or allocation of costs may be modified or changed by the Provider Company without the necessity of an amendment to this Agreement; provided that, in each instance, all services rendered hereunder shall be at actual cost thereof, fairly and equitably assigned or allocated, all in accordance with the requirements of the EAct 2005 and any orders promulgated thereunder. The Provider Company shall review with the Client Company any proposed material change in the method of assignment or allocation of costs hereunder and the Parties must agree to any such changes before they are implemented.

Section 2.3 Provider Company shall render a monthly report to Client Company that shall reflect the information necessary to identify the costs charged for that month in accordance with the Uniform System of Accounts for Mutual and Subsidiary Service Companies. Client Company shall remit to Provider Company all charges billed to it within 30 days of receipt of the monthly report. Any amounts not paid by the due date will be subject to a late charge of .5 % per month until the remittance is received.

Section 2.4 It is the intent of this Agreement that the payment for services rendered by Provider Company to Client Company under this Agreement shall cover all the costs of its doing business, to the extent related to the provision of the services, including, but not limited to, salaries and wages, office supplies and expenses, outside services employed, property insurance, injuries and damages, employee pensions and benefits, miscellaneous general expenses, rents, maintenance of structures and equipment, depreciation and amortization, and compensation for use of capital as permitted by applicable laws and regulations.

Section 2.5 Provider Company and Client Company acknowledge that the regulatory commission of the appropriate jurisdiction has the right to review the amount of compensation to be paid by Client Company hereunder.

ARTICLE III - TERM

This Agreement shall become effective as of the date first written above, subject only to the receipt of any required regulatory approvals from any State regulatory commission with jurisdiction over Client Company and shall continue in force until terminated by Provider Company or Client Company, upon not less than 90 days prior written notice to the other Party. This Agreement shall also be subject to termination or modification at any time, without notice, if and to the extent performance under this Agreement may conflict with the EAct 2005 or with

any rule, regulation or order of the FERC or any State regulatory commission with jurisdiction over Client Company adopted before or after the date of this Agreement.

ARTICLE IV - MISCELLANEOUS

Section 4.1 Accounting.- All accounts and records of Provider Company shall be kept in accordance with applicable rules and regulations promulgated by the FERC, in particular, the Uniform System of Accounts for Centralized Service Companies in effect as of or after the date hereof.

Section 4.2 Access to accounts and records.- Provider Company shall permit Client Company access to its accounts and records including the basis and computation of assignments and allocations.

Section 4.3 Confidentiality.- All the information received by each Party from the other under this Agreement and provided in connection with the services, shall be confidential in nature and may not be used for purposes other than those contemplated in this Agreement, unless otherwise agreed upon by the Parties.

The Parties undertake, in relation to the above information, to safeguard it diligently and not to disclose it to any third party without the consent of the other Party, other than to consultants, contractors, advisors or other service providers (“**Advisors**”) in conjunction with the provision or performance of the services. In any such case, the Party disclosing the information to such Advisors shall ensure that such Advisors assume the confidentiality undertaking provided for herein.

Notwithstanding anything to the contrary in this Agreement, the Parties may use and disclose such information when required to do so in litigation, administrative, regulatory or other legal proceedings or as otherwise required by applicable law or to the extent required to do so by a governmental authority with jurisdiction over the disclosing Party; provided that the disclosing Party must first provide notice to the other Party and afford the non-disclosing Party an opportunity to seek a protective order or other relief to prevent or limit disclosure of such information.

In connection therewith, when, as a result of the performance of the services, Provider Company gains access to commercially sensitive information from Client Company, Provider Company, in accordance with applicable law, shall adopt the necessary measures to maintain the confidentiality of such information.

The provisions of this clause shall apply while the Agreement remains in force and for a period of two years after its termination, other than when the confidential information becomes publically known for reasons other than a breach by a Party of its obligations hereunder.

Section 4.4 Transparency.- Provider Company and Client Company shall inform the regulators of the transactions performed among them under this Agreement, if requested and/or required by applicable law.

Section 4.5 Notices.- All notifications among the Parties in connection with this Agreement shall be made in writing and delivered by hand with written acknowledgement of receipt by the other Party or by fax, post or e-mail, as well as any other means, provided that a record is at all times made of receipt by the addressee.

Section 4.6 Severability.- Should any court or competent authority declare null and void any of the provisions of this Agreement, the whole document shall remain in force, other than such null and void provision(s).

Section 4.7 Modification.- The terms of this Agreement may only be amended by written agreement between the Parties.

Section 4.8 Assignment.- All of the rights under this Agreement are exclusive to the Parties and may not be assigned without the prior written consent of the Parties.

Section 4.9 Taxes.- Each Party shall, at its own expenses, pay all applicable taxes, based on applicable law. Each Party also shall provide to the other, in a timely manner, any documents and information that may be requested that may assist in the preparation of any tax filing or planning.

Section 4.10 Dispute Resolution.- In the event that any conflict or dispute arises among any of the Parties in connection with this Agreement, the Parties shall enter into negotiations in order to try to resolve it by mutual agreement within 30 days, or any other period as may be agreed between the Parties.

Section 4.11 Applicable law.- This Agreement shall be governed by the laws of the State of Maine.

Section 4.12 Ethics.- Each Party shall conduct itself in accordance with the highest ethical standards and principles.

Section 4.13 Entire Agreement.- This Agreement includes all of the agreements, terms, and conditions agreed on by the Parties regarding its subject matter, and supersedes any other prior agreement or conversation between the Parties in relation to such subject matter.

This Agreement may be executed (such execution to be evidenced by either signature or electronic consent consistent with federal and state law on electronic signature) in any number of counterparts, each of which shall be deemed an original, but all of which together shall constitute one and the same instrument.

[SIGNATURE PAGE FOLLOWS]

IN WITNESS WHEREOF, the Parties have caused this Agreement to be executed as of the date and year first above written.

CENTRAL MAINE POWER COMPANY

By: _____

Name:

Title:

By: _____

Name:

Title:

NECEC TRANSMISSION LLC

By: _____

Name:

Title:

By: _____

Name:

Title:

APPENDIX A

Description of Services to be Provided by Provider Company and Determination of Charges for Such Services to the Client Companies

This document sets forth the description of services that can be provided by Avangrid Group affiliate companies (“Provider Company”) and the methodologies used to determine the cost, assignment, and allocation of services provided and to assign or allocate such costs to Avangrid Group affiliate companies (“Client Company”) within the Avangrid Group.

Description of Services

A description of each of the services performed by Provider Company, which may be modified from time to time, is presented below.

1. Accounting Services such as establishing accounting policies, the maintenance of books and records, corporate financial consolidation, preparation of financial reports, annual capital and operating plan preparation (on a per company and corporate basis), fixed asset accounting, and compliance with applicable laws and regulations.
2. Audit Services include the management of an entity-wide framework of corporate controls.
3. Corporate Planning Services include the preparation of corporate plans, budgets and financial forecasts, monitoring trends and evaluating business opportunities.
4. Executive Services include general and administrative management and strategic planning.
5. Finance and Treasury Services include the coordination of activities relating to securities issuances, monitoring capital markets, cash management, bank reconciliation and administering insurance programs, and tax services for the coordination of income, property and revenue tax compliance and tax accounting.
6. Governmental Affairs Services include monitoring, reviewing and researching legislation and lobbying government officials.
7. Accounts Payable Services include the accurate and timely payment of invoices and employee expense reports, allocation of expenses to the proper general ledger accounts, production of annual reports to the IRS, maintenance of vendor information and source documents, processing checks and wire transfers, and performing bank reconciliations.

8. Human Resources Services include the establishment and administration of employee policies, the supervision of compliance with legal requirements in the areas of employment, compensation, benefits and employee health, welfare, and safety and contract negotiation and relations management with labor unions; and employee performance management program. May also maintain the employee master files relating to each employee as well as manage recruiting, training, and promotions.
9. Corporate Security Services include the establishment of a security program and entity-wide governance framework to manage, oversee and assist the organization in meeting its corporate, legal, and regulatory responsibilities with regard to the protection of cyber, physical and information assets.
10. Payroll Services include the supervision and coordination of the calculations, records and control requirements necessary to generate payment of employee salaries and wages and to maintain relevant employee information.
11. Records Retention Services include coordinating and maintaining a program for ensuring safe on- and off-site records retention in accordance with applicable regulations.
12. Regulatory Management Services include coordination of the Client Companies' rates and regulatory economics departments including rate-related compliance matters.
13. Legal Services include the coordination and direction of law and regulatory departments, legal support for all of the Client Companies, including managing litigation, contract review and negotiations and participating in state and federal regulatory proceedings.
14. Other Corporate Support Services may include corporate communications services, transportation, logistical and administrative support.
15. Transmission and Supply Services include activities related to the coordination and direction of electric and/or gas transmission, storage, and supply functions.
16. Distribution Services include activities related to the coordination and direction of electric and/or gas distribution functions.
17. Information Technology Services include centralized information technology services for the Client Companies such as Data Center Operations, IS Networking and Telecommunications systems operations and maintenance, software applications development and maintenance, technology development, end user support, and printing and mailing of utility customer bills.

18. Supply Chain Services include centralized purchasing services such as procurement of materials and supplies, fleet services, contract administration and materials management for the Client Companies.
19. Customer Services include call center operations including responding to Client Companies' customer calls, customer billing, accounts receivable, credit and collections services, customer satisfaction monitoring and management of low income programs.
20. Engineering Services include centralized customary engineering services including design engineering, general engineering, construction engineering and GIS technology development, meter services and testing and operations.
21. Commodity Planning Service includes coordination and direction of gas or electric supply planning and procurement at utility or non-utility companies.

Provider Company accounting, billing and cost allocation methods utilize the “Uniform System of Accounts for Mutual Service Companies and Subsidiary Service Companies” and are structured so as to comply with the FERC standards for service companies in registered holding-company systems.

Cost Assignment

Provider Company maintains an accounting system that enables costs to be identified by Internal Order (I/O) number. These I/O numbers will indicate whether the cost is a direct charge or the result of an allocated charge. The primary inputs to the accounting system are time reports, accounts payable invoices and journal entries. Charges for labor are calculated using the employees' hourly rate. All Provider Company employees will maintain a record of their time. Employees will utilize separate I/O to record their activities, including the services provided directly to Client Companies. All employees will charge their time on a daily basis using designated increments. The time sheets will be reviewed and approved by department supervisors. The wages of those employees, such as administrative assistants and secretaries, who generally assist employees who provide services directly to system companies, will be allocated based on the allocation of the wages of the employees they assist. Time records will be maintained for three years. Indirect attributable costs are charged to the services performed in proportion to the directly assigned costs or other appropriate cost allocations.

Costs will be accumulated by I/O number and assigned as follows:

1. Costs accumulated in an I/O number for services specifically performed for a single Client Company will be directly assigned or billed to that Client Company.

2. Costs accumulated in an I/O number for services specifically performed for two or more Client Companies will be distributed among those Client Companies using methods determined on a case-by-case basis consistent with the nature of the work performed and on one of the allocation methods described below.
3. Costs accumulated in an I/O number for services of a general nature, which are applicable to all Client Companies, will be allocated among all Client Companies, including the holding company, and billed to them using the global allocation factor.

Cost Allocation

Provider Company uses cost allocation methods designed to fully distribute costs. Provider Company's cost allocation methodology is comprised of the following three steps:

1. To "direct charge" all labor, materials and other expenses to Client Companies whenever feasible.
2. To allocate directly attributable costs to Client Companies based upon a measurable cost causing relationship, i.e., payroll department costs are allocated on the number of employees for each Client Company.
3. To allocate indirectly attributable costs that are common to all Client Companies, including the holding company, using the global allocation factor taking into consideration the relative size of each Client Company with regards to gross revenues, gross payroll expense and plant.

Costs that can be directly attributed to direct charges are allocated in proportion to the direct charges or other appropriate cost allocations. For example, direct labor charged to prepare testimony for a specific utility not only includes the direct payroll charge (the hourly rate times the hours reported) but also includes the cost of that individual's proportional payroll overhead cost, and such other overheads as common asset usage, occupancy charges and management overhead charges (commonly referred in aggregate as an Administrative and General Overhead).

Provider Company will independently charge Client Company for the use of office space used exclusively by employees of Provider Company that provide services to Client Company. The charge for the use of office space will be determined based on a cost allocation.

General and administrative costs that are not associated with a specific, identifiable, causal relationship are pooled and allocated to all system companies, including the holding company.

Allocation Methods

Allocations related to Direct Labor Charges

The following allocations will be applied to the Direct Labor Charges:

Payroll Overhead Charge will be calculated to recover costs associated with labor, such as pension, benefits, lost time and payroll taxes. The payroll overhead costs will be charged to Client Companies based on direct labor charges. The rate is computed by dividing the annual payroll overhead expenses by the annual base labor dollars.

Other Allocations applied to Direct Labor Charges will consist of the following:

1. Common Asset Usage Overhead:

The Common Asset Usage Overhead allocates the cost of furniture and desktop equipment (including PC's) used by Provider Company. The rate is calculated by dividing the economic carrying costs of the assets by the total actual labor dollars of employees using those assets. This overhead is directly applied to all Provider Company labor charged or allocated to Client Companies.

2. Occupancy Overhead:

The Occupancy Overhead allocates costs related to the workspace occupied by Provider Company employees. The rate is calculated by dividing the economic carrying costs for the buildings by the total actual labor dollars of employees working in those buildings. This overhead is directly applied to all Provider Company labor charged or allocated to Client Companies.

3. Management Overhead:

This overhead represents the management cost of a function within Provider Company. It is based on the ratio of Provider Company supervisory wages to all other wages. This fixed rate is applied to all direct labor charged to Client Companies.

An Alternative Allocation Applied to Direct Labor Charges or Other Direct Charges

An alternative allocation applied to direct labor charges or other direct charges is commonly referred to as an Administrative and General Support Adder. This overhead is a general overhead used in place of other specific administrative and general support overheads and is added to total costs of client services. The purpose is to recover indirect administrative and general expenses incurred and not otherwise charged directly to Client Companies for certain activities. The adder also includes expenses associated with office facilities, including furniture and office equipment, used in performing these administrative functions.

Allocations related to Distributed Services

The following ratios will be used to allocate costs for services not directly assigned but pooled and allocated based on a causal measurement:

Number of Employees Ratio - Based on the number of employees benefiting from the performance of a service. This ratio will be determined annually based on actual count of applicable employees at the end of the previous calendar year and may be adjusted periodically due to a significant change.

Accounts Payable Ratio - Based on the number of invoices processed for each of the specific Client Companies. This ratio is determined annually based on the actual count of invoices at the end of the previous calendar year and may be adjusted periodically due to a significant change.

Number of Customers Ratio - Based on the number of customers at each Client Company benefiting from the performance of a service. This ratio will be determined annually based on the average annual customer count and may be adjusted periodically due to a significant change.

Global Allocation Factor - This formula will be determined annually based on the average of gross plant (original plant in service), gross payroll charges (salaries and wages, including overtime, shift premium and lost time, but excluding pension, payroll taxes and other employee benefits) and gross revenues during the previous calendar year and may be adjusted for any known and reasonable quantifiable events or at such time as may be required due to significant changes. This formula is commonly referred to as the Massachusetts Formula.

Regulated Global - 5 Allocation Factor - This formula is derived through utilization of the same data as the Regulated Global allocation factor above, but it is limited to data of the following six utility subsidiaries: NYSEG, CMP, MNG, MEPCO and RGE.

Regulated Global - 3 Allocation Factor - This formula is derived through utilization of the same data as the Regulated Global - 5 allocation factor above, but it is limited to data of the following three utility subsidiaries: NYSEG, CMP, and RGE.

Commodity Energy Supply Transaction System Allocation Factor - This formula is used to allocate the cost of management of the Energy Supply Transaction System to all Client Companies that benefit from this system. The formula is derived through utilization of the gas and/or electric supply costs of the Client Companies and reflects the proportion of such costs occurring between these entities.

Commodity - Global Allocation Factor - This formula is used to allocate the cost of commodity planning, procurement, and sale when the service is applicable to or benefits all Client Companies, regardless of whether they are a gas, electric, or combined company. The formula is derived through utilization of the gas and/or electric supply costs of the Client Companies and reflects the proportion of such costs occurring between these entities.

Commodity - Regulated Gas Allocation Factor - This formula is used to allocate costs for gas commodity planning, procurement and sale for regulated gas utility Client Companies. The

formula is derived through utilization of the gas supply costs of the regulated gas utility affiliates and reflects the proportion of such costs occurring between these entities.

Electric Allocation Factor - This formula is used to allocate costs for the coordination and direction of electric transmission issues for the benefit of regulated electric utility Client Companies and departments. The formula is derived through utilization of the same data as the global allocation noted above, but it is limited to data of electric operating companies or departments.

EXHIBIT K

Form of Reciprocal Easement Agreement

RECIPROCAL EASEMENT INDENTURE

THIS INDENTURE made and entered into this _____ day of _____, _____, by and between **CENTRAL MAINE POWER COMPANY**, a Maine corporation having its office and principal place of business at 83 Edison Drive, Augusta, Kennebec County, Maine 04336, hereinafter “CMP” and **NECEC TRANSMISSION LLC**, a Delaware limited liability company having a mailing address of _____ hereinafter “NECEC”.

W I T N E S S E T H**Grant from CMP to NECEC:**

CMP does hereby grant unto NECEC, **WITHOUT COVENANT**, a 50 foot wide non-exclusive easement, as hereinafter described, across CMP’s 300 foot wide strip of land known as the Section 200 / 251 corridor situated in Lewiston, Androscoggin County, Maine, for the purposes of (i) constructing and maintaining a road across CMP’s land; and (ii) to pass and repass on foot and with vehicles over said road for the purpose of ingress and egress, in common with others, to land of NECEC, as hereinafter described, across CMP’s said strip of land. The easement is over a portion of the CMP’s land acquired from Central Securities Corporation by a deed dated November 14, 1930, recorded at the Androscoggin County Registry of Deeds in Book 407, Page 526 (also see a Deed of Merger between Central Maine Power Company and Central Securities Corporation dated December 23, 2005 and recorded in said Registry in Book 3761, Page 304), the “Section 200 / 251 Corridor”.

Said easement granted to NECEC hereunder shall hereinafter be referred to as the “NECEC Easement” and is more particularly bounded and described as follows:

A 50-foot-wide easement situated easterly of but not adjacent to US Route 202 in the City of Lewiston, Androscoggin County, Maine more particularly described as follows: **[INSERT LEGAL DESCRIPTION OF NECEC EASEMENT]**

Said NECEC Easement to be for all purposes including but not limited to roadway construction, maintenance and improvement for ingress and egress by vehicles and foot, together with the right to convey these rights to others, provided however, CMP may require NECEC to place electric and communications utilities underground if placing such utilities overhead would, in the sole opinion of CMP, conflict with CMP’s existing or proposed facilities.

For further reference see Exhibit A attached hereto and made a part hereof.

The NECEC Easement shall be subject to the conditions, limitations and covenants set forth below and shall, subject thereto, be for the benefit of and appurtenant to land of NECEC described in a deed recorded in the Androscoggin County Registry of Deeds in Book ____ Page ____, all other abutting land now owned by NECEC, and all other abutting land owned by NECEC in the future.

The above-described NECEC Easement granted by CMP to NECEC is subject to the terms and conditions described below, and NECEC does hereby covenant and agree as follows:

1. Any road constructed and located within the NECEC Easement shall be constructed and maintained at the sole risk and expense of NECEC and shall be constructed, operated and maintained in compliance with all laws, ordinances and regulations pertaining thereto.
2. Any road constructed and located within the NECEC Easement shall be constructed in a manner so that the finished grade provides sufficient clearance between the road surface and all overhead utility lines located within the NECEC Easement.
3. Installation of utilities installed within the NECEC Easement shall be coordinated in advance with CMP and may be required to be placed underground.
4. NECEC shall be responsible for the cost of relocating or raising pole structures and or wires, located within CMP's land, if CMP determines in its sole discretion that the (i) grade of any road or (ii) the use of the NECEC Easement as set forth herein interferes with said pole structures or wires, or CMP's maintenance thereof.
5. NECEC will take any steps necessary to ensure that erosion does not occur and will, at their sole expense, repair any erosion which may occur as a result of the exercise of the rights herein granted.
6. NECEC will at their sole expense, obtain prior to any construction, and will at all times comply with and maintain the road in compliance with all local, state and federal permits, and will comply with all laws, ordinances, rules, regulations and requirements of all federal, state and local governments and appropriate departments, commissions, boards and officers thereof, which may be applicable to the exercise of the rights granted herein and use of the NECEC Easement contemplated hereby.
7. NECEC agrees to pay any and all cost for repair of damage by them or their employees, agents or contractors, caused to CMP's land or to CMP's transmission lines and facilities, now or hereinafter located on CMP's land, or equipment connected thereto, resulting from the exercise of the NECEC Easement and rights herein granted.
8. The NECEC Easement herein granted to NECEC shall at all times be subject to and shall not in any way limit CMP's rights in or use of CMP's land, and nothing in this Indenture shall be construed to limit or restrict CMP's use of its land in its operation as a public utility or otherwise, including but not limited to the installation, removal and maintenance of utility lines and wires, structures and equipment. Further, nothing in this Indenture shall be construed as conveying any right to NECEC not expressly granted herein nor shall any liability arise from CMP's use of its land.
9. NECEC, for itself and its successors and assigns, agree to indemnify CMP and its parent corporation and affiliates and its and their directors, officers, employees, agents, contractors,

successors and assigns and hold it and them harmless from and against all claims, penalties, fines, demands and actions arising out of any willful act or gross negligence of NECEC or its employees, agents, representatives or contractors or its invitees.

10. CMP, for itself and its successors and assigns, reserves the right to relocate the NECEC easement, at CMP's own expense, if the NECEC easement interferes with CMP's use of its land in its operation as a public utility or otherwise, including but not limited to the installation, removal and maintenance of utility lines and wires, structures and equipment, provided that any such relocation provides the same utility to NECEC as the NECEC Easement granted herein.

Grant from NECEC to CMP:

NECEC does hereby grant unto CMP, **WITHOUT COVENANT**, a 50-foot-wide non-exclusive easement, in common with others, as hereinafter described, across NECEC's land situated in Lewiston, Androscoggin County, Maine, for the right and easement to pass and repass on foot and with vehicles over, along and across a roadway as now exist, or to be constructed in the future by NECEC or CMP, across NECEC's said land to land of CMP, as hereinafter described (the "CMP Easement").

The Easement herein conveyed is over a portion of NECEC's land acquired from _____ by deeds recorded at the Androscoggin County Registry of Deeds in Book ____, Page ____.

Said Easement granted to CMP hereunder shall hereinafter be referred to as the "CMP Easement" and is more particularly bounded and described as follows:

A 50-foot-wide easement situated between the easterly line of US Route 202 and the above described Section 200 / 251 Corridor in the City of Lewiston, Androscoggin County, Maine, more particularly described as follows: **[INSERT LEGAL DESCRIPTION OF CMP EASEMENT]**

Said CMP Easement to be for all purposes including but not limited to roadway construction, maintenance and improvement for ingress and egress by vehicles and foot, together with the right to convey these rights to others.

For further reference see Exhibit A attached hereto and made a part hereof.

The CMP Easement shall be subject to the conditions, limitations and covenants set forth below and shall, subject thereto, be for the benefit of and appurtenant to the above described Section 200 / 251 Corridor, all other abutting land now owned by CMP, and all other abutting land owned by CMP in the future.

The above-described CMP Easement granted by NECEC to CMP is subject to the terms and conditions described below, and Grantor does hereby covenant and agree as follows:

1. Any road constructed and located within the CMP Easement shall be constructed and maintained at the sole risk and expense of CMP and shall be constructed, operated and maintained in compliance with all laws, ordinances and regulations pertaining thereto.
2. Any road constructed and located within the CMP Easement shall be constructed in a manner so that the finished grade provides sufficient clearance between the road surface and all overhead utility lines located within the CMP Easement.

3. Installation of utilities installed within the CMP Easement shall be underground and coordinated in advance with NECEC.
4. CMP will take any steps necessary to ensure that erosion does not occur and will, at their sole expense, repair any erosion which may occur as a result of the exercise of the rights herein granted.
5. CMP will at its sole expense, obtain prior to any construction, and will at all times comply with and maintain the road in compliance with all local, state and federal permits, and will comply with all laws, ordinances, rules, regulations and requirements of all federal, state and local governments and appropriate departments, commissions, boards and officers thereof, which may be applicable to the exercise of the rights granted herein and use of the CMP Easement contemplated hereby.
6. CMP agrees to pay any and all cost for repair of damage by it or its employees, agents or contractors, caused to NECEC's land and facilities, now or hereinafter located on NECEC's land, or equipment connected thereto, resulting from the exercise of the CMP Easement and rights herein granted.
7. The CMP Easement herein granted to CMP shall at all times be subject to and shall not in any way limit NECEC's rights in or use of NECEC's land, and nothing in this Indenture shall be construed to limit or restrict NECEC's use of its land in its operation as a public utility or otherwise, including but not limited to the installation, removal and maintenance of utility lines and wires, structures and equipment. Further, nothing in this Indenture shall be construed as conveying any right to CMP not expressly granted herein nor shall any liability arise from NECEC's use of its land.
8. CMP, for itself and its successors and assigns, agree to indemnify NECEC and its parent corporation and affiliates and its and their directors, officers, employees, agents, contractors, successors and assigns and hold it and them harmless from and against all claims, penalties, fines, demands and actions arising out of any willful act or gross negligence of CMP or its employees, agents, representatives or contractors or its invitees.
9. NECEC, for itself and its successors and assigns, reserves the right to relocate the CMP Easement, at NECEC's own expense, if the CMP easement interferes with NECEC's use of its land, provided that any such relocation provides the same utility to CMP as the CMP Easement granted herein.

The terms CMP and NECEC shall include their respective successors, affiliates, heirs or assigns.

IN WITNESS WHEREOF, the parties hereto have set their hands and seals on this Indenture, all as of the day and year first above written.

[Signature pages follows.]

4523

CENTRAL MAINE POWER COMPANY

Witness

By: _____

Witness

By: _____

STATE OF MAINE

_____, ss.

_____, .

The above named _____, personally appeared before me and acknowledged the foregoing instrument to be his/her free act and deed in his said capacity and the free act and deed of said Central Maine Power Company.

Notary Public

Printed Name
My Commission Expires:

NECEC TRANSMISSION LLC

Witness

By:_____

STATE OF MAINE

_____, ss.

_____, .

The above named _____ personally appeared before me and acknowledged the foregoing instrument to be his/her free act and deed in his/her said capacity and the free act and deed of said NECEC Transmission LLC.

Notary Public/Attorney At Law

Printed Name
My Commission Expires:

EXHIBIT A

**Indenture by and between CENTRAL MAINE POWER COMPANY and NECEC
TRANSMISSION LLC**

Attachment E
NECEC LLC Certificate of Good Standing

Delaware

The First State

Page 1

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY "NECEC TRANSMISSION LLC" IS DULY FORMED UNDER THE LAWS OF THE STATE OF DELAWARE AND IS IN GOOD STANDING AND HAS A LEGAL EXISTENCE SO FAR AS THE RECORDS OF THIS OFFICE SHOW, AS OF THE NINTH DAY OF JUNE, A.D. 2020.

AND I DO HEREBY FURTHER CERTIFY THAT THE ANNUAL TAXES HAVE BEEN PAID TO DATE.



7200064 8300

SR# 20205595854

You may verify this certificate online at corp.delaware.gov/authver.shtml

A handwritten signature in black ink, appearing to read "JB", is written over a horizontal line. Below the line, the text "Jeffrey W. Bullock, Secretary of State" is printed.

Jeffrey W. Bullock, Secretary of State

Authentication: 203079200

Date: 06-09-20

Delaware

The First State

Page 1

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THAT "NECEC TRANSMISSION LLC" IS DULY FORMED UNDER THE LAWS OF THE STATE OF DELAWARE AND IS IN GOOD STANDING AND HAS A LEGAL EXISTENCE NOT HAVING BEEN CANCELLED OR REVOKED SO FAR AS THE RECORDS OF THIS OFFICE SHOW AND IS DULY AUTHORIZED TO TRANSACT BUSINESS.

THE FOLLOWING DOCUMENTS HAVE BEEN FILED:

CERTIFICATE OF FORMATION, FILED THE EIGHTEENTH DAY OF DECEMBER, A.D. 2018, AT 9:57 O'CLOCK A.M.

AND I DO HEREBY FURTHER CERTIFY THAT THE AFORESAID CERTIFICATE IS THE ONLY PAPER OF RECORD, THE LIMITED LIABILITY COMPANY IN QUESTION NOT HAVING FILED AN AMENDMENT NOR HAVING MADE ANY CHANGE WHATSOEVER IN THE ORIGINAL CERTIFICATE AS FILED.

AND I DO HEREBY FURTHER CERTIFY THAT THE SAID "NECEC TRANSMISSION LLC" WAS FORMED ON THE EIGHTEENTH DAY OF DECEMBER, A.D. 2018.

AND I DO HEREBY FURTHER CERTIFY THAT THE ANNUAL TAXES HAVE BEEN PAID TO DATE.



7200064 8315

SR# 20205595854

You may verify this certificate online at corp.delaware.gov/authver.shtml

A handwritten signature in black ink, appearing to read "JBullock", is written over a horizontal line. Below the line, the text "Jeffrey W. Bullock, Secretary of State" is printed.

Jeffrey W. Bullock, Secretary of State

Authentication: 203079199

Date: 06-09-20

Delaware

The First State

Page 1

I, JEFFREY W. BULLOCK, SECRETARY OF STATE OF THE STATE OF DELAWARE, DO HEREBY CERTIFY THE ATTACHED ARE TRUE AND CORRECT COPIES OF ALL DOCUMENTS ON FILE OF "NECEC TRANSMISSION LLC" AS RECEIVED AND FILED IN THIS OFFICE.

THE FOLLOWING DOCUMENTS HAVE BEEN CERTIFIED:

CERTIFICATE OF FORMATION, FILED THE EIGHTEENTH DAY OF DECEMBER, A.D. 2018, AT 9:57 O'CLOCK A.M.

AND I DO HEREBY FURTHER CERTIFY THAT THE AFORESAID CERTIFICATES ARE THE ONLY CERTIFICATES ON RECORD OF THE AFORESAID LIMITED LIABILITY COMPANY, "NECEC TRANSMISSION LLC".

A handwritten signature of Jeffrey W. Bullock in black ink, written over a horizontal line.

Jeffrey W. Bullock, Secretary of State

7200064 8100H
SR# 20205595854

Authentication: 203079207
Date: 06-09-20

You may verify this certificate online at corp.delaware.gov/authver.shtml

State of Delaware
Secretary of State
Division of Corporations
Delivered 09:57 AM 12/18/2018
FILED 09:57 AM 12/18/2018
SR 20188209415 - File Number 7200064

STATE OF DELAWARE
CERTIFICATE OF FORMATION
OF LIMITED LIABILITY COMPANY

The undersigned authorized person, desiring to form a limited liability company pursuant to the Limited Liability Company Act of the State of Delaware, hereby certifies as follows:

1. The name of the limited liability company is NECEC Transmission LLC.
2. The Registered Office of the limited liability company in the State of Delaware is located at 160 Greentree Drive, Suite 101 in the City of Dover, DE, Zip Code 19904. The name of the Registered Agent at such address upon whom process against this limited liability company may be served is National Registered Agents.

By: 

Name: Robert D. Kump

Attachment F
Copies of Published Notice of Intent to File
and List of Abutters

CLASSIFIED

INSIDE
Legal Ads
Garage Sales
Antiques & Auctions

Thursday, September 24, 2020

SECTION B

Public Notices

Public Notices are a permanent and independent record of government and court actions. These include state and local government meetings, rule making, available contracts, zoning changes, and many more, as required by law. In addition, parties to some court proceedings, such as foreclosures, probate, and estate actions are required to publish notices to ensure notification of affected parties, as well as the general public. These notices also alert business owners, large and small, to potential government contractual jobs, helping to ensure economic activity across a level playing field. Public notices have existed to ensure transparency in all levels of government since the founding of the United States.

State and local notices are published in Maine newspapers and are also recorded at mainenotices.com, where anyone can browse or search notices, and sign up to receive email alerts when relevant notices appear.

ANNOUNCEMENTS

Public Notices

Public Notice

Crooker Construction LLC intends to blast ledge at their Alna quarry on Tuesday, October 6, 2020, weather permitting or on the next available good day, between the hours of 9am and 4pm.

Public Notice

Northern New England Passenger Rail Authority
Notice of Meeting
September 28, 2020

To the members of the Northern New England Passenger Rail Authority: Pursuant to 23 M.R.S.A. c 621 Subchapter II, a meeting of Northern New England Passenger Rail Authority will be held on Monday, September 28, 2020 via online Zoom Conference. Participants may also dial in at 1-929-205-6099. The meeting identification is 81523685171. Additional login information is posted on www.nnepra.com. The Meeting will start at 10:00am.

Patricia Quinn Executive Director. Meeting changes or cancellations will be posted on www.nnepra.com.

Public Notice

NOTICE OF PUBLIC MEETING

The members of the Education Committee of the Finance Authority of Maine (FAME) will meet at 8:30 a.m. on Wednesday, September 30, 2020. This will be an online meeting via Zoom. Some items may be considered in executive session. For further information on this meeting or to obtain conference call information, contact Martha Johnston, Director of Education, P.O. Box 949, Augusta, Maine, 04332-0949, (207) 623-3263.

Public Notice

NOTICE OF PUBLIC SALE

Notice is hereby given that in accordance with the Judgment of Foreclosure and Sale entered September 30, 2019, as affected by an Order on Plaintiff's Motion to Enlarge the Deadline to Commence Publication entered on August 6, 2020, in the action entitled PennyMac Loan Services, LLC v. Frank C. Coco and Nancy J. Coco, by the Maine District Court, Division of Augusta, Docket No. AUGDC-RE-19-017, wherein the Court adjudged the foreclosure of a mortgage granted by Frank C. Coco and Nancy J. Coco, mortgagors, to Mortgage Electronic Registration Systems, Inc., as Mortgagee, as nominee for Proficio Mortgage Ventures, LLC, its successors and/or assigns, dated November 20, 2012 and recorded in the Somerset County Registry of Deeds in Book 4603, Page 82, should the period of redemption have expired without redemption of the property by the mortgagors, a public sale of the property described in the mortgage will be conducted on

October 21, 2020 commencing at 10:00 AM at the Office of Brock & Scott, PLLC, 190 U.S. Route One, 2nd Floor-Rear, Falmouth, ME 04105.

Public Notices

& Scott, PLLC, 190 U.S. Route One, 2nd Floor-Rear, Falmouth, ME 04105.

The property is located at 167 Northern Avenue, Augusta, ME 04330, in Kennebec County, reference as described in said mortgage.

The sale will be by public auction. All bidders for the property will be required to make a deposit of \$5,000.00 in cash, certified or bank check at the time of the public sale made payable to Brock & Scott, PLLC, which deposit is non-refundable as to the highest bidder. The balance of the purchase price shall be paid within thirty (30) days of the public sale. In the event a representative of PennyMac Loan Services, LLC is not present at the time and place stated in this notice, no sale shall be deemed to have occurred and all rights to reschedule a subsequent sale are reserved.

Additional terms will be announced at the public sale.

PennyMac Loan Services, LLC by its attorneys, Brock & Scott, PLLC John Michael Ney, Jr., Esq., Sonia J. Buck, Esq., 1080 Main Street, Suite 200 Pawtucket, RI 02860

Public Notice

NOTICE OF PUBLIC SALE

Notice is hereby given that in accordance with the Judgment of Foreclosure and Sale entered September 19, 2019, as affected by an Order on Plaintiff's Motion to Enlarge the Deadline to Commence Publication entered on August 27, 2020, in the action entitled National Mortgage LLC d/b/a Champion Mortgage Company v. Shari H. Freese, et al., by the Maine District Court, Division of Skowhegan, Docket No. SKODC-RE-18-77, wherein the Court adjudged the foreclosure of a mortgage granted by Shari H. Freese, mortgagors, to Mortgage Electronic Registration Systems, Inc., as Mortgagee, as nominee for Proficio Mortgage Ventures, LLC, its successors and/or assigns, dated November 20, 2012 and recorded in the Somerset County Registry of Deeds in Book 4603, Page 82, should the period of redemption have expired without redemption of the property by the mortgagors, a public sale of the property described in the mortgage will be conducted on

October 27, 2020 commencing at 10:00AM at the Office of Brock & Scott, PLLC, 190 U.S. Route One, 2nd Floor-Rear, Falmouth, ME 04105.

The property is located at 30 Freese Road, Norridgewock, ME 04957, in Somerset County, reference as described in said mortgage.

The sale will be by public auction. All bidders for the property will be required to make a deposit of \$5,000.00 in cash, certified or bank check at the time of the public sale made payable to Brock & Scott, PLLC, which deposit is non-refundable as to the highest bidder. The balance of the purchase price shall be paid within thirty (30) days of the public sale. In the event a representative of Nationstar Mortgage LLC d/b/a Champion Mortgage Company is not present at the time and place stated in this notice, no sale shall be deemed to have occurred and all rights to reschedule a subsequent sale are reserved.

Additional terms will be announced at the public sale. Nationstar Mortgage LLC d/b/a Champion Mortgage Company by its attorneys, Brock & Scott, PLLC

Public Notices

Sonia J. Buck, Esq., 1080 Main Street, Suite 200 Pawtucket, RI 02860

Public Notice

NOTICE TO CONTRACTORS INVITATION FOR BIDS

The Maine Department of Agriculture, Conservation and Forestry is conducting a competitive bid process for the Johnson Bay & Cobscook State Park Boat Ramp Renovations in Lubec & Edmunds, Maine. Bids will be opened and read aloud at the Bureau of Real Estate Management, 4th Floor, Cross State Office Building, 111 Sewall Street, 77 State House Station, Augusta, Maine 04333 at **2:00 p.m. October 14, 2020.**

A pre-bid conference will be held at the Cobscook State Park site at **11:00 a.m. October 11, 2020.**

Johnson Bay & Cobscook State Park Boat Ramp Renovations project involves removal and replacement of the precast concrete ramp planks, precast concrete curb, riprap, and paving. The final completion date is **December 1, 2020.** The project shall be substantially completed by **November 20, 2020.**

The detailed Notice to Contractors is on the Bureau of General Services website: <http://www.maine.gov/dafs/brem/business-opportunities>

Public Notice

PUBLIC NOTICE NOTICE OF INTENT TO FILE

Please take notice that Central Maine Power Company, with mailing address at 83 Edison Drive, Augusta, ME 04336, and NECEC Transmission LLC, with mailing address at One City Center, Portland, ME 04101, both with phone number 207-242-1682 are intending to file an application for partial transfer of a Site Location of Development Act ("Site Law") and Natural Resources Protection Act ("NRPA") permit (pursuant to the provisions of 38 M.R.S. §§ 481 to 489-E and 480-A to 480-J) and water quality certification with the Maine Department of Environmental Protection ("DEP") on or about September 25, 2020, pursuant to Chapter 2, Section 21(C) and Chapter 305, Section 17 of the DEP's rules.

The application is for partial transfer of the May 11, 2020 DEP Site Law and NRPA permits and water quality certification for the New England Clean Energy Connect (NECEC) Project from Central Maine Power Company to NECEC Transmission, LLC. The NECEC Project will transmit Canadian hydropower to the New England Control Area. The NECEC Project will be located in the following 14 unorganized/deorganized townships and 25 organized municipalities: Beattie Township, Merrill Strip Township, Skinner Township, Raytown Township, Appleton Township, Hobbstown Township, Bradstreet Township, Parlin Pond Township, Johnson Mountain Township, West Forks Plantation, Moxie Gore, Bald Mountain Township, The Forks Plantation, Concord Township, Alna, Anson, Auburn, Caratunk, Chesterville, Cumberland, Durham, Embden, Farmington, Greene, Industry, Jay, Leeds, Lewiston, Livermore Falls, Moscow, New Gloucester, New Sharon, Pownall, Starks, Whitefield, Wilton, Windsor, Wiscasset, and Woolwich.

A request for a public hearing or a request that the Board of Environmental Protection assume jurisdiction over this application must be received by the DEP in writing, no later than 20 days after the application is found by the DEP to be complete and is accepted for processing.

Public Notices

A public hearing may or may not be held at the discretion of the Commissioner or Board of Environmental Protection. Public comment on the application will be accepted throughout the processing of the application.

The application will be filed for public inspection at the DEP's office in Augusta during normal working hours. A copy of the application may also be seen at the municipal offices in Alna, Anson, Auburn, Caratunk, Chesterville, Cumberland, Durham, Embden, Farmington, Greene, Industry, Jay, Leeds, Lewiston, Livermore Falls, Moscow, New Gloucester, New Sharon, Pownall, Starks, Whitefield, Wilton, Windsor, Wiscasset, and Woolwich, Maine, and at the Androscoggin, Cumberland, Franklin, Kennebec, Lincoln, Sagadahoc, and Somerset county offices.

Written public comments may be sent to James Beyer of the DEP, Bureau of Land Resources, 17 State House Station, Augusta, Maine 04333-0017, jim.r.beyer@maine.gov.

Public Notice

PUBLIC NOTICE State of Maine Department of Marine Resources RFP# 202009138 Pre-Qualified Vendor List for Annual Vessel Haul Out

The State of Maine is seeking proposals to be considered for inclusion on a Pre-Qualified Vendor List for Annual Vessel Haul Out Services for the Bureau of Marine Patrol's Large Patrol Vessels (35' to 46' Diesel Powered Fiberglass Lobster Boat-Style Vessels).

A copy of the RFP, as well as the Question & Answer Summary and all amendments related to this RFP, can be obtained at the following website: <http://www.maine.gov/dafs/bbm/procurement/services/vendors/payvis>

Proposals must be submitted to the State of Maine Division of Procurement Services, via e-mail, to the following email address: Proposals@maine.gov. Proposal submissions must be submitted no later than 11:59 pm, local time, on December 1, 2020. Proposals will be opened at the Burton M. Cross Office Building, 111 Sewall Street - 4th Floor, Augusta, Maine the following business day. Proposals not submitted to the Division of Procurement Services' aforementioned email address by the aforementioned deadline will not be considered for contract award

Public Notice

Regional School Unit 1

is seeking Request for Proposals (RFP) for snowplowing services at the Woolwich Central School located at 137 Nequasset Rd., Woolwich, Maine. Interested parties can obtain a copy of the proposal by emailing drichards@rsu1.org or in person at 34 Wing Farm Parkway, Bath, ME. To be considered, bids must be submitted by September 30th, 2020 at 2:00 PM.

Public Notice

State of Maine Department of Health and Human Services Maine Center for Disease Control and Prevention RFP# 202008125 Healthcare Emerging Threats Services

The State of Maine is seeking proposals for Healthcare Epidemiology Program to expand its Emerging Threats services.

A copy of the RFP, as well as the Question & Answer Summary and all amendments related to the RFP, can be obtained at: <https://www.maine.gov/dafs/bbm/procurement/services/vendors/rfps>

Proposals must be submitted to the State of Maine Division of Procurement Services, via e-mail, at: Proposals@maine.gov. Proposals must be received no later than 11:59 p.m., local time, on October 13, 2020. Proposals will be opened the following business day. Proposals not submitted to the Division of Procurement Services' aforementioned e-mail address by the aforementioned deadline will not be considered for contract award.

Public Notices

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Public Notice

STATE OF MAINE

KENNEBEC COUNTY PROBATE COURT 95 STATE STREET AUGUSTA, MAINE 04330

NOTICE TO CREDITORS 18-C M.R.S. §3-801 (1)

The following Personal Representatives have been appointed in the Estates noted. The first publication date of this notice is **September 17, 2020**. If you are a creditor of an Estate listed below, you must present your claim within four months of the first publication date of this Notice to Creditors or be forever barred.

You may present your claim by filing a written statement of your claim on a proper form with the Register of Probate of this Court or by delivering or mailing to the Personal Representative listed below at the address published by the Personal Representative's name a written statement of the claim indicating the basis therefore, the name and address of the claimant and the amount claimed or in such other manner as the law may provide. See 18-C M.R.S. §3-804. 20-089 Estate of Dennis K. Hedman, late of China; Patricia Ford, 514 Poplar St., Lakehurst, NJ 08733.

20-416 Estate of Audrey J. Cogswell, late of Windsor; Charles S. Cogswell, 196 Legion Park Rd., Windsor, ME 04363. 20-455 Estate of John J. Laiko, II, late of Augusta; Linda L. Pullen, PO Box 4717, Augusta, ME 04330. 20-456 Estate of Mirjam Neal Wood, late of Vienna; Allan C. Neal, 13 Lattimer Rd., Gray, ME 04039. 20-461 Estate of Sherrell L. Wilmot, late of Winthrop; William B. Wilmot, 199 Route 133, Winthrop, ME 04364. 20-463 Estate of Hilary M. Paquette, late of Benton; Paul E. Paquette, 1815 Seneca Blvd., Winter Springs, FL 32708. 20-464 Estate of Margaret E. Foss, late of China; Doreen Casabona, 69 Hiley Brook Rd., Stowe, MA 01775. 20-465 Estate of Peter J. Wenckus, late of Randolph; Donna Wenckus, 257 Windsor St., Randolph, ME 04346. 20-467 Estate of Shirley M. Shaw, late of China; George W. Shaw III, 185 Weeks Mills Rd., South China, ME 04358. 20-468 Estate of Maralie

PETITION FOR FORMAL ADJUDICATION OF INTESTATE AND APPOINTMENT OF PERSONAL REPRESENTATIVE OR FOR FORMAL ADJUDICATION:

20-382 Estate of Nancy Marie Eaton, late of Belgrade, deceased; Christine Shute, 32 Witten Rd., Burnham, ME 04922. Telephone c/o Walfer F. McKee, Esq. and Kurt C. Peterson, Esq., 620-8294

20-496 Estate of Rosemary Rowe, late of Vassalboro, deceased; Jon Karl Rowe, 162 Cushnoc Rd., Vassalboro, ME 04989. Telephone c/o Steven T. Hayes, Esq., 623-2543. PETITION FOR CHANGE OF NAME: 2020-0462 Ashta Starr Noke of Sidney to Ashta Starr Mercer. 2020-0471 Warren Wesley Stillman of Oakland to Warren Wesley Thibodeau. 2020-0472 Brooke Jean Belanger of Waterville to Brooke Jean Lavoie. 2020-0482 Cheyenne Dawn Paron of Benton to Cheyenne Dawn Knights. 2020-0483 Danielle Jennifer Moody of Pittston to Danielle Jennifer Burns. 2020-0489 Molly Beth Meader of Monmouth to Micah Benjamin

Public Notices

Meader. 2020-0490 Valerie LaPointe Glueck of Oakland to Valerie LaPointe. 2020-0515 April Elizabeth Ylvisaker of Manchester to April Elizabeth Tardiff.

Dated: September 17, 2020 /s/ Kathleen G. Ayers Register or Probate

Public Notice

STATE OF MAINE

KENNEBEC COUNTY PROBATE COURT 95 STATE STREET AUGUSTA, MAINE 04330

NOTICE TO CREDITORS 18-C M.R.S. §3-801 (1)

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You may present your claim by filing a written statement of your claim on a proper form with the Register of Probate of this Court or by delivering or mailing to the Personal Representative listed below at the address published by the Personal Representative's name a written statement of the claim indicating the basis therefore, the name and address of the claimant and the amount claimed or in such other manner as the law may provide. See 18-C M.R.S. §3-804. 20-089 Estate of Dennis K. Hedman, late of China; Patricia Ford, 514 Poplar St., Lakehurst, NJ 08733. 20-416 Estate of Audrey J. Cogswell, late of Windsor; Charles S. Cogswell, 196 Legion Park Rd., Windsor, ME 04363. 20-455 Estate of John J. Laiko, II, late of Augusta; Linda L. Pullen, PO Box 4717, Augusta, ME 04330. 20-456 Estate of Mirjam Neal Wood, late of Vienna; Allan C. Neal, 13 Lattimer Rd., Gray, ME 04039. 20-461 Estate of Sherrell L. Wilmot, late of Winthrop; William B. Wilmot, 199 Route 133, Winthrop, ME 04364. 20-463 Estate of Hilary M. Paquette, late of Benton; Paul E. Paquette, 1815 Seneca Blvd., Winter Springs, FL 32708. 20-464 Estate of Margaret E. Foss, late of China; Doreen Casabona, 69 Hiley Brook Rd., Stowe, MA 01775. 20-465 Estate of Peter J. Wenckus, late of Randolph; Donna Wenckus, 257 Windsor St., Randolph, ME 04346. 20-467 Estate of Shirley M. Shaw, late of China; George W. Shaw III, 185 Weeks Mills Rd., South China, ME 04358. 20-468 Estate of Maralie

Public Notices

P. O'Brien, late of Hallowell; Mark S. O'Brien, 12 Myrtle St., Augusta, ME 04330. 20-469 Estate of Jan M. Bragdon, late of Waterville; Morgan T. Bragdon, PO Box 252, Shawmut, ME 04975. 20-470 Estate of William P. Seavey, Jr., late of Windsor; Emily B. Warman, 199 Greeley Rd., Windsor, ME 04363. 20-476 Estate of Karen N. Wood, late of Manchester; Daniel J. Echler, PO Box 7, Winthrop, ME 04364. 20-477 Estate of Herbert S. Normandeau, late of Winslow; Ronald L. Loubier, 462 Maple Ridge Rd., Winslow, ME 04901. 20-480 Estate of Robert H. Morris, late of Waterville; Hilary D. Koch, 31 Mt. Merici Ave., Waterville, ME 04901. 20-481 Estate of David C. Paradis, late of Albion; Lori P. Tuttle, 3 Mike's Lane, #2, Smithfield, ME 04978. 20-485 Estate of Estella L. Whitten, late of Clinton; Jon H. Whitten, Sr., 12 McNally Rd., Clinton, ME 04027. 20-491 Estate of Victor A. Caprara, late of Winthrop; Carol A. Caprara, 106 Hathaway Rd., Winthrop, ME 04364. 20-492 Estate of Carolyn H. Andrus, late of Gardiner; Kathleen A. Andrus, One Green St., Gardiner, ME 04345. 20-493 Estate of Mark E. Lanzieri, late of Monmouth; Annie M. Lanzieri, 95 Chipmunk Lane, Monmouth, ME 04259. 20-495 Estate of Phyllis M. Lamarre, late of Gardiner; Alice L. Stewart, 1145 Vilas St., Leavenworth, KS 66048. 20-497 Estate of Laurianne T. Fecteau, late of Winslow; Lee W. Fecteau, 22 15th Fire Rd., China, ME 04358. 20-498 Estate of Ida L. Oxtan, late of Oakland; Frederick D. Henry, 90 Oak Hill Dr., Oakland, ME 04963. 20-500 Estate of Irene E. Vensel, late of Oakland; Raymond D. Vensel, 111 Oak Hill Dr., Oakland, ME 04963. 20-502 Estate of Lauren B. Rheame, late of Winthrop; Anthony J. Rheame, 41 Birch St., Winthrop, ME 04364. 20-503 Estate of Anthony P. Fournier, late of Litchfield; Judy D. Fournier, PO Box 386, Sabattus, ME 04280. 20-504 Estate of Rene B. Rodrigue, late of Hallowell; Paul J. Rodrigue, 1795 Walden Pond Rd., Fort Pierce, FL 34945. 20-510 Estate of Patricia D. Roix, late of Sidney; Michelle Newbegin, 162 Bog Rd., Augusta, ME 04330. 20-513 Estate of Jennie R. Richard, late of Waterville; Vicki A. Johnson, 23 Court St., Winslow, ME 04901. 20-514 Estate of Yvette C. Mitchell, late of Waterville; Paul J. Mitchell, Jr., 35 Arthur Ave., Marblehead, MA 01945, and Linda M. Price, 2 West 6th St., #701, Tulsa, OK 74119. 20-516 Estate of Marlene M. McFadden, late of Sidney; Shannon McFadden, 2047

Public Notices

West River Rd., Sidney, ME 04330.

Dated: September 17, 2020 /s/ Kathleen G. Ayers Register of Probate

Public Notice

STATE OF MAINE KENNEBEC, ss. DISTRICT COURT LOCATION: AUGUSTA DOCKET NO. RE-20-21

LAKEVIEW LOAN SERVICING, LLC PLAINTIFF V. WILLIAM REDMUN AKA WILLIAM E. REDMUN III DEFENDANT

ORDER ON PLAINTIFF'S MOTION FOR SERVICE BY PUBLICATION TITLE TO REAL ESTATE INVOLVED

Before the Court is the Motion of Plaintiff's attorney, Ashley L. Janotta, Esq., of the law firm of Bendett & McHugh, PC, 30 Danforth Street, Suite 104, Portland, ME 04101, for an Order allowing Service by Alternate Means on the Defendant William Redmun A/K/A William E. Redmun III, named in a Summons and Complaint, Title to Real Estate Involved, now pending before this Honorable Court. M.R. Civ. P. 4 (g) (1). Plaintiff moves for service to be made on the Defendant William Redmun A/K/A William E. Redmun III, by publishing a copy of this Order once a week for three (3) successive weeks in the Kennebec Journal/Morning Sentinel, a newspaper of general circulation in Kennebec County. Plaintiff's Motion is granted.

This is an action for the foreclosure of a mortgage on real property and may affect real property of the Defendant located at, 2748 Hallowell Road, Litchfield, ME 04350, and described in such Mortgage Deed as recorded in Book 11437 at Page 249 in the Kennebec Registry of Deeds, Litchfield, Maine.

After due diligence, Plaintiff Lakeview Loan Servicing, LLC, has been unable to make William Redmun A/K/A William E. Redmun III. Plaintiff has met the requirements of Rule 4(g)(1)(A)-(C). M.R. Civ. P. 4(g)(1)(A)-(C); 4(g)(2).

IT IS ORDERED that service be made upon the Defendant William Redmun A/K/A William E. Redmun III by publishing a copy of this Order once a week for three (3) successive weeks in the Kennebec Journal/Morning Sentinel, a newspaper of general circulation in Kennebec County and by mailing a copy of this Order as published to the Defendant at 2748 Hallowell Road, Litchfield, ME 04350, the

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THUNDER

Continued from Page C1

and we are really excited. Rashovsky is going to be our captain and Moioffer is going to be one of his assistant (captains). We are still working on the other assistant (captains).”

Rashkovsky said he learned last season what it takes to be successful at the Tier II junior hockey level.

“It’s definitely an honor to be named captain at this level, and it’s not something that I will take lightly,” Rashkovsky said. “I think I owe a lot of that to my experience from last year. I am coming into the season more prepared, just knowing the league and being familiar with the team. I am obviously going to take that seriously and I want to do my best day in and day out to be successful for myself and to help the team win.”

Hodge said he also is expecting forwards Troy Ladka, Nate Chickering and Tyler Fox to be key contributors this season.

Ladka played club college hockey last season at Lehigh Valley, where he scored eight goals and had three assists in 20 games. He’s reuniting this year with Chickering, his former teammate at Proctor Academy. Chickering scored seven goals and had 11 assists in 25 games for Proctor last season. Fox (22 goals, 24 assists in 40 games) is coming from the Toledo Cherokee of the USPHL Premier League.

Chickering and Fox have found a place on Rashkovsky’s line during the practices and scrimmages so far this preseason.

“Nate Chickering and Tyler Fox, my linemates, they have been great to play with, they are fast and speedy guys. I will find success with them,” Rashkovsky said.

The Thunder forwards are expecting to shoot the puck more this season. Rashkovsky said the team wants to put 30-40 shots on goal per game.

“That’s how you score more goals,” Hodge said. “The more shots you take, the more chances you have to score. We got to do a better job of shooting the puck, and I told them we got to be a shoot-first team. As many shots we can get, we need to get them to the net so goalies can make saves.”

As for Twin City’s defense, Rashkovsky likes the size that Jack Gilligan and Philip DeCresce add to the team.

The Thunder will start the season with Devon Bobak and Connor Leslie in the crease. Draft pick Noah Ping is still battling a lower-body injury that he suffered in training camp. He’s expected to be out for another month. Both Bobak and Leslie were two of the 40 goalies competing for a spot at the beginning of Twin City’s main camp last month.

Hessinger trying out

When the Maine Nordiques’ started their training camp last week, defenseman Derek Hessinger wasn’t expecting he’d be on the other side of the Androscoggin River this week.

The Twin City Thunder brought in Hessinger, who played last season with the Nordiques, for a tryout after he cut last week near the end of the Nordiques’ camp. Hessinger currently is not on the Thunder’s active roster.

“No, I was not expected to be here, but I am happy to be here,” Hessinger said.

Hessinger had one assist in 44 games last season for the Nordiques.

Hessinger skated with Thunder assistant coach Cam Labrie over the summer and reached out to Labrie this past weekend to see if there was an opportunity with the Thunder.

Currently, there are two other players with Nordiques ties on the Thunder’s NCDC roster: forward Sergei Anisimov and defenseman Daisuke Egusa.

One of Hessinger’s former teammates at Shattuck St. Mary’s in Fairbault, Minnesota, was Alexander Kozic, a goalie for the Thunder in 2019-20 who is currently at Bowdoin College.

“He told me he had a great experience. I know he had a different coach but he had a good experience with the coach,” Hessinger said. “He only had good things to say (about the Thunder).”

Thunder have options

Hodge has told the current players that bringing in players — such as Hessinger — for evaluations might not be uncommon early in the season, especially with some junior teams deciding to sit out the season because of the coronavirus.

The United States Hockey League — the lone Tier I junior hockey league under the USA Hockey League umbrella — had the Madison (Wisconsin) Capitals and the Cedar Rapids (Iowa) Roughriders decided to suspend operations. In the NAHL, the lone Tier II junior hockey league under USA Hockey, the Kansas City (Missouri) Scouts, Corpus Christi (Texas) IceRays, Springfield (Illinois) Junior Blues and the Jamestown (New York) Rebels all decided to sit out the season.

“(The players) got to be ready. At any time, (other) players are going to be available,” Hodge said. “The players here have to make themselves irreplaceable.”

The Thunder brought in forward Gabe Potyk at the start of training camp. Potyk played with Corpus Christi last season and is currently on the Thunder’s roster.

“It’s unfortunate what’s going on, but hopefully it will make our (team) stronger and the rest of the league stronger,” Hodge said.

Monarchs

without coach

The New Hampshire Junior Monarchs will come to the Norway Savings Bank Arena without their head coach, Ryan Frew, who is currently in a New Hampshire hospital with a serious health issue.

“They will definitely have some emotion on their side,” Hodge said. “Ryan is a great guy and a great coach and we wish him well. (Thunder assistant coach) Alex Drulia and I were just talking; we just saw (Frew) two weeks ago up in New Hampshire playing games and he was fine. You would have never known anything was wrong.”

Thunder’s opening day roster

Goalies: Devon Bobak (free agent), Connor Leslie (free agent), Noah Ping (draft pick, on the injured list).

Defensemen: Andrew Cole (draft pick), Philip DeCresce (free agent) P.J. Donahue (free agent), Daisuke Egusa (free agent), Jack Gilligan (tender), Matt Herick (free agent), Joey Potter (tender).

Forwards: Jimmy Akouri (free agent), Justin Angle (draft pick, currently away from the team for personal reasons), Sergei Anisimov (free agent), Ben Charboneau (free agent), Dominic Chasse (returner), Nathan Chickering (tender), Tyler Fox (free agent), Noah Furman (free agent), Danny Klatt (free agent), Troy Ladka (free agent), Martin Moioffer (returner), Gabe Potyk (free agent), Nick Rashkovsky (returner), Alex Ray (draft pick), Hunter Schmitz (draft pick).

GOLF

Continued from Page C1

through sponsors, ticket sales and special events.

On Wednesday, 18 foursomes played the Falmouth Country Club

SAYERS

Continued from Page C1

an extraordinary man who overcame a great deal of adversity during his NFL career and life.”

Sayers became a stockbroker, sports administrator, businessman and philanthropist for several inner-city Chicago youth initiatives after his pro football career was cut short by serious injuries to both knees.

“Gale was one of the finest men in NFL history and one of the game’s most exciting players,” NFL Commissioner Roger Goodell said. “Gale was an electrifying and elusive runner who thrilled fans every time he touched the ball. He earned his place as a first-ballot Hall of Famer.”

PUBLIC HEARING
The Town of Sabattus Planning Board will be conducting a **Public Hearing on September 29, 2020 at 7:00PM** to hear the following:
Sabattus Lake Marina
Chad B. Sylvester
Cove Lane, Sabattus ME 04280
Tax Map 15 Lot 07 & 08
The Public Hearing is open to the public with limited seating. Written comments and/or email will also be accepted prior to the meeting deadline. Mail to: Town of Sabattus Planning Board 190 Middle Road Sabattus ME 04280 or email: ddouglass@lisbonme.org

NOTICE OF MORTGAGEE’S SALE OF REAL PROPERTY OF MECAP, LLC: 55 Key Hill Road, Greene, Maine ~ Tax Map 14 / Lot 029 Androscoggin County Registry of Deeds, Book 9446, Page 33

By virtue of and in execution of the Power of Sale contained in a certain First Mortgage, Security Agreement and Financing Statement, in favor of LOSU, LLC (“Lender”) dated August 30, 2016, with a mailing address of PO Box 124, Freeport, Maine 04032, recorded in the Androscoggin County Registry of Deeds at, Book 9446, Page 33 (“Mortgage”), which Mortgage is held by Lender, for breach of the conditions of said Mortgage and for the purpose of foreclosing the fee title in and to the mortgaged premises, there will be sold at Public Auction Sale on October 6, 2020 at 10:00 a.m., at KRE Brokerage Group, 367 US Route One, North Building, Falmouth, Maine the real and personal property subject to the Mortgage, viz: A certain lot or parcel of land, together with any easements and buildings, improvements and fixtures thereof, situated in the Town of Greene and located at 55 Key Hill Road, Greene, Maine (referenced as Town of Greene, Tax Map 14 / Lot 029) (in all “Property”), as more fully described in said Mortgage.

Terms of Sale: The Property will be sold “AS IS, WHERE IS”, WITHOUT ANY WARRANTIES, EXPRESS OR IMPLIED as to the condition of the Property or the status of title.

A. A bidder who wishes to bid on the Property must submit as a qualification to bid at the auction a deposit of Twenty-Five Thousand Dollars (\$25,000), in cash, cashier’s check or certified check (U.S. funds) to be increased to Ten Percent (10%) of the highest bid within Five (5) business days following the execution of a Purchase and Sale Agreement. The remaining balance of the purchase price shall be due and payable by wire transfer, bank check, certified check or cashier’s check (U.S. funds) at closing. All checks should be made payable to “KRE Brokerage Group” (“Auctioneer”). In the event that the highest bidder fails to close pursuant to the Purchase and Sale Agreement, the Property will be sold to the next highest bidder willing to purchase the Property or readvertised for sale at the Lender’s discretion.

B. The successful bidder must sign a Purchase and Sale Agreement with Lender, requiring a closing within Thirty (30) days of the date of the public sale. The Property will be sold by Mortgagee’s Release Deed Without Covenant to the highest bidder. In the event and to the extent that Lender (or its designee) is the highest bidder, no down payment or contract will be required.

C. Lender and Auctioneer reserve the right to modify or add to the terms of sale. The terms and conditions of sale, including additions to or modifications of the terms set forth above, will be announced at the sale.

D. The sale of the Property will be made without warranties and subject to, among other things: (a) prior liens, restrictions, senior encumbrances, tenancies, recorded or unrecorded leases, utility easements, rights of way whether recorded or unrecorded and/or visible on the face of the earth, encumbrances which maintain validity at the date of conveyance and any other conditions whether known or unknown; (b) any unpaid taxes or assessments; and (c) any facts which an accurate survey or inspection of the Property might show.

E. Further information regarding the auction may be obtained by contacting KRE Brokerage Group, 367 US Route One, North Building, Falmouth, Maine 04105, Telephone (207) 781-2959 (www.kingrealestate.com).
DATED: August 25, 2020
LOSU, LLC

By its counsel:
HIRSHON LAW GROUP P.C.
By: David M. Hirshon, Esq.
PO Box 124
Freeport, ME 04032
(207) 831-6700
STATE OF MAINE August 25, 2020
CUMBERLAND, ss.
Personally appeared before me the above-named David M. Hirshon, Esq., and made oath that he signed this instrument as his own free act and deed and the free act and deed of LOSU, LLC

Before me,
Lori Harmon
Notary Public, State of Maine
My commission expires: April 24, 2021

course as part of the Char-ity Classic, with proceeds going to the Barbara Bush hospital. Corcoran said following the tournament that the Live + Work Open will be donating \$50,000 to the hospital.

“I think it’s quite an

Sayers was a two-time All-American at Kansas and inducted into the College Football Hall of Fame as well. He was selected by Chicago with the fourth pick overall in 1965, and his versatility produced dividends and highlight-reel slaloms through opposing defenses right from the start.

He tied one NFL record with six touchdowns in a game and set another with 22 touchdowns in his first season: 14 rushing, six receiving, one punt and one kickoff return. Sayers was a unanimous choice for Offensive Rookie of the Year.

“I played football a long time and I never saw a better football player than Gale Sayers,” said Hall of Fame tight end Mike Ditka, Sayers’ teammate from 1965-66. “I mean that. He was poetry in motion. Besides that,

NOTICE OF PUBLIC SALE
Notice is hereby given that in accordance with the Judgment of Foreclosure and Sale entered March 12, 2019 in the action entitled *Bayview Loan Servicing, LLC v. Donna L. Smith Ika Donna L. Briggs, et al.*, by the Maine District Court, located in Farmington, Maine, Docket No. RE-2018-013, wherein the Court adjudged the foreclosure of a mortgage granted by Donna L. Smith to U.S. Bank, N.A. dated June 21, 2013 and recorded in the Franklin County Registry of Deeds in Book 3567, Page 297, the period of redemption having expired, a public sale of the property described in the mortgage will be conducted on
October 22, 2020 at 10:00 AM
At Bendett & McHugh, P.C.,
30 Danforth Street, Suite 104,
Portland, Maine

The property is located at 10 Fortier Road, Jay, Maine, as described in said mortgage. The sale will be by public auction. All bidders for the property will be required to make a deposit of \$5,000.00 in certified or bank check at the time of the public sale made payable to Bendett & McHugh, P.C., which deposit is non-refundable as to the highest bidder. The balance of the purchase price shall be paid within sixty (60) days of the public sale. In the event a representative of the mortgagee is not present at the time and place stated in this notice, no sale shall be deemed to have occurred and all rights to reschedule a subsequent sale are reserved. **If the sale is set aside for any reason, the Purchaser at the sale shall be entitled only to a return of the deposit paid. The Purchaser shall have no further recourse against the Mortgagor, the Mortgagee or the Mortgagee’s attorney.**

This property will be sold as is. Additional terms will be announced at the public sale. Bayview Loan Servicing, LLC by its attorneys, BENDETT & MCHUGH, P.C., 30 Danforth Street, Ste. 104 Portland, ME 04101 207-221-0016

PUBLIC NOTICE

NOTICE OF INTENT TO FILE

Please take notice that Central Maine Power Company, with mailing address at 83 Edison Drive, Augusta, ME 04336, and NECEC Transmission LLC, with mailing address at One City Center, Portland, ME 04101, both with phone number 207-242-1682 are intending to file an application for partial transfer of a Site Location of Development Act (“Site Law”) and Natural Resources Protection Act (“NRPA”) permit (pursuant to the provisions of 38 M.R.S. §§ 481 to 489-E and 480-A to 480-I) and water quality certification with the Maine Department of Environmental Protection (“DEP”) on or about September 25, 2020, pursuant to Chapter 2, Section 21(C) and Chapter 305, Section 17 of the DEP’s rules. The application is for partial transfer of the May 11, 2020 DEP Site Law and NRPA permits and water quality certification for the New England Clean Energy Connect (NECEC) Project from Central Maine Power Company to NECEC Transmission, LLC. The NECEC Project will transmit Canadian hydropower to the New England Control Area. The NECEC Project will be located in the following 14 unorganized/deorganized townships and 25 organized municipalities: Beattie Township, Merrill Strip Township, Skinner Township, Raytown Township, Appleton Township, Hobbsdown Township, Bradstreet Township, Parlin Pond Township, Johnson Mountain Township, West Forks Plantation, Moxie Gore, Bald Mountain Township, The Forks Plantation, Concord Township, Alna, Anson, Auburn, Caratunk, Chesterville, Cumberland, Durham, Embden, Farmington, Greene, Industry, Jay, Leeds, Lewiston, Livermore Falls, Moscow, New Gloucester, New Sharon, Pownall, Starks, Whitefield, Wilton, Windsor, Wiscasset, and Woolwich. A request for a public hearing or a request that the Board of Environmental Protection assume jurisdiction over this application must be received by the DEP, in writing, no later than 20 days after the application is found by the DEP to be complete and is accepted as complete for processing. A public hearing may or may not be held at the discretion of the Commissioner of the Board of Environmental Protection. Public comment on the application will be accepted throughout the processing of the application. The application will be filed for public inspection at the DEP’s office in Augusta during normal working hours. A copy of the application may also be seen at the municipal offices in Alna, Anson, Auburn, Caratunk, Chesterville, Cumberland, Durham, Embden, Farmington, Greene, Industry, Jay, Leeds, Lewiston, Livermore Falls, Moscow, New Gloucester, New Sharon, Pownall, Starks, Whitefield, Wilton, Windsor, Wiscasset, and Woolwich, Maine, and at the Androscoggin, Cumberland, Franklin, Kennebec, Lincoln, Sagadahoc, and Somerset county offices. Written public comments may be sent to James Beyer of the DEP, Bureau of Land Resources, 17 State House Station, Augusta, Maine 04333-0017, jim.r.beyer@maine.gov.

accomplishment,” said Deane Beman, the Live + Work in Maine Open’s honorary chair and the former commissioner of the PGA Tour. “The PGA Tour has supported charities in every community that we play. That’s part

he was a great guy. It’s just a shame that he’s gone. He was special.”

Ditka, later coached Walter Payton, giving him an up-close look at two of the best running backs. But the

NOTICE OF PUBLIC SALE
Notice is hereby given that in accordance with the Judgment of Foreclosure and Sale entered August 4, 2020 in the action entitled *U.S. Bank Trust, N.A., as Trustee for LSF10 Master Participation Trust v. Bruce A. Evenson*, by the Maine District Court, located in Farmington, Maine, Docket No. RE-2019-029, wherein the Court adjudged the foreclosure of a mortgage granted by the late Dorothy M. Evenson f/k/a Dorothy M. Adams and Bruce A. Evenson to Mortgage Electronic Registration Systems, Inc., as nominee for Advanced Financial Services, Inc., dated August 4, 2006 and recorded in the Franklin County Registry of Deeds in Book 2796, Page 144, the period of redemption having expired, a public sale of the property described in the mortgage will be conducted on
October 15, 2020 at 10:00 AM
At Bendett & McHugh, P.C.,
30 Danforth Street, Suite 104,
Portland, Maine

The property is located at 74 Walker Hill Road, Jay, Maine, as described in said mortgage. The sale will be by public auction. All bidders for the property will be required to make a deposit of \$5,000.00 in certified or bank check at the time of the public sale made payable to Bendett & McHugh, P.C., which deposit is non-refundable as to the highest bidder. The balance of the purchase price shall be paid within sixty (60) days of the public sale. In the event a representative of the mortgagee is not present at the time and place stated in this notice, no sale shall be deemed to have occurred and all rights to reschedule a subsequent sale are reserved. **If the sale is set aside for any reason, the Purchaser at the sale shall be entitled only to a return of the deposit paid. The Purchaser shall have no further recourse against the Mortgagor, the Mortgagee or the Mortgagee’s attorney.** This property will be sold as is. Additional terms will be announced at the public sale. U.S. Bank Trust, N.A., as Trustee for LSF10 Master Participation Trust by its attorneys, BENDETT & MCHUGH, P.C., 30 Danforth Street, Ste. 104 Portland, ME 04101 207-221-0016

STATE OF MAINE

ANDROSCOGGIN COUNTY PROBATE COURT

NOTICE OF PETITION FOR CHANGE OF NAME

TO ALL PERSONS INTERESTED IN ANY OF THE FOLLOWING PETITIONS: Notice is hereby given by the respective petitioner(s) that they have filed a petition for change of name, as follows: This matter will be heard beginning at 9:00 AM or as soon thereafter as it may be, on the 13th day of October, A.D., 2020. The requested change of name may be granted on or after the hearing date, if no sufficient objection be heard.

2020-296 BILLIE CLEVELAND of Auburn, adult. Petition to change name to ALLY CLEVELAND, presented by Billie Cleveland.

2020-307 REBECCA JO LEVASSEUR of Lewiston, adult. Petition to change name to REBECCA JO LAMBERT, presented by Rebecca Jo Levasseur.

2020-314 ELIZABETH PAIGE BURNHAM of Lisbon, adult. Petition to change name to JADEN MARK BURNHAM, presented by Elizabeth Paige Burnham.

2020-315 DION JOHN DAVIS of Lewiston, adult. Petition to change name to DION DANGER O’LEARY, presented by Dion John Davis.

Date: September 18, 2020 /s/ Tom Reynolds
Register of Probate

STATE OF MAINE

ANDROSCOGGIN COUNTY PROBATE COURT

PROBATE NOTICES

TO ALL PERSONS INTERESTED IN ANY OF THE ESTATES LISTED BELOW Notice is hereby given by the respective Petitioners that they have filed Petitions for appointment of Personal Representatives in the following Estates. These matters will be heard at 9:00 AM or as soon thereafter as they may be, on the 13th day of October, 2020. The requested appointments may be made on or after the hearing date, if no sufficient objection be heard. This notice complies with the requirements of 18-C M.R.S. § 3-403 and Maine Probate Rule 4. (List shall show name of Petitioner and address and telephone number at which Petitioner or his attorney may be reached.)

2020-277 ROBERT A. TANGUAY, late of Hudson FL, deceased. Petition for Formal Probate of Will or Appointment of Personal Representative or Both, presented by Paul D. Weinstein, Esq., Weinstein, Lovell & Ordway, P.A., 431 Main St., Saco, ME 04072, on behalf of Tina M. Buinikas.

2020-280 CLAIRE C. AUBE, late of Lewiston, deceased. Petition for Formal Probate of Will or Appointment of Personal Representative or Both, presented by Paul R. Dionne, Esq., Dionne & Couturier, 465 Main St., Ste.201, Lewiston, ME 04240-6738, Personal Representative.

Dated: September 18, 2020 /s/ Thomas Reynolds
Register of Probate

STATE OF MAINE

ANDROSCOGGIN COUNTY PROBATE COURT

NOTICE TO CREDITORS

18-C M.R.S. §3-801(1)

The following Personal Representatives have been appointed in the Estates noted. The first publication date of this notice is September 18, 2020. If you are a creditor of an Estate listed below, you must present your claim within four months of the first publication date of this Notice to Creditors or be forever barred. You may present your claim by filing a written statement of your claim on a proper form with the Register of Probate of this Court or by delivering or mailing to the Personal Representative listed below at the address published by the Personal Representative’s name a written statement of the claim indicating the basis therefore, the name and address of the claimant and the amount claimed or in such other manner as the law may provide. See 18-C M.R.S. §3-804.

2020-292 ROBERT D. WAKEFIELD, SR., late of Auburn, deceased. Deborah J. Wakefield, 34 Whitney Ave., Portland, ME 04102 and Robert D. Wakefield, Jr., 9 Emerson Way, Sudbury, MA 01776, Personal Co-Representatives.

2020-294 MARGARET A. STROUT, late of Poland, deceased. Sioux Barron, 118 Schellinger Rd., Poland, ME 04274, Personal Representative.

2020-302 MARY A. TANGNEY, late of Lisbon Falls, deceased. Kevin J. Tangney, 36 Hinkley St., Lisbon Falls, ME 04252, Personal Representative.

2020-308 DONALD C. CARON, late of Auburn, deceased. Normand D. Caron, P.O. Box 1545, Lewiston, ME 04240, Personal Representative.

2020-309 RICHARD L. MURPHY, late of Lewiston, deceased. Sheila Murphy, 103 Cotton Rd., Lewiston, ME 04240, Personal Representative.

2020-310 MARCEL E. MOORE, late of Lewiston, deceased. Theresa M. Pare, 2 Windward Ln., Scituate, MA 02066, Personal Representative.

2020-312 STEPHEN LEE CREED, late of Lewiston, deceased. Jerry Dean Creed, 199 Mount Zion Rd., Camden, SC 29020, Personal Representative.

2020-313 RAYMOND RONALD CHALOUX, late of Lewiston, deceased. Joline Susan Chaloux, 55 Allen Ave., Lewiston, ME 04240, Personal Representative.

2020-317 SANDRA D. GLEICHMAN, late of Auburn, deceased. Cynthia Mae Hart, 370 Court St., Auburn, ME 04210, Personal Representative.

2020-324 DANIEL K. PARENT, late of Lisbon Falls, deceased. Elizabeth E. Parent, 23 Booker St., Lisbon Falls, ME 04252, Personal Representative.

2020-331 FLORENCE R. TRACY, late of North Turner, deceased. Faye A. Swanhholm, 60 Parkview Ct., Readfield, ME 04335-3136, Personal Representative.

2020-332 RICHARD G. AUDET, late of Sabattus, deceased. Denise J. Valencia, 52 Old County Rd., Sabattus, ME 04280, Personal Representative.

2020-335 PAUL LAURIE VACHON, late of Lisbon, deceased. Dustin Robert Vachon, 122 Foye Rd, Wiscasset, ME 04578, Personal Representative.

2020-341 WILLIAM REILLY, late of Lewiston, deceased. David Paul Reilly, 129 Brentwood St., Portland, ME 04103, Personal Representative.

2020-342 BARBARA PHILBROCK SWANSON, late of Minot, deceased. Jill Marie Piper, 318 Holbrook Rd., Minot, ME 04258, Personal Representative.

Dated: September 18, 2020 /s/ Tom Reynolds
Register of Probate

Public Notices

are a permanent and independent record of government and court actions. These include state and local government meetings, rule making, available contracts, zoning changes, and many more, as required by law. In addition, parties to some court proceedings, such as foreclosures, probate, and estate actions are required to publish notices to ensure notification of affected parties, as well as the general public. These notices also alert business owners, large and small, to potential government contractual jobs, helping to ensure economic activity across a level playing field. Public notices have existed to ensure transparency in all levels of government since the founding of the United States. State and local notices are published in Maine newspapers and are also recorded at mainenotices.com, where anyone can browse or search notices, and sign up to receive email alerts when relevant notices appear.

of our DNA. And to be able to help even when we run into problems we had this year and can’t even hold a tournament, for me to be here and to help raise that amount even with out a golf tournament, it makes me feel good.”

greatest performance he saw might have been Sayers’ six-touchdown game.

Public and Legal Notices

Public and Legal Notices



**TOWN OF BOOTHBAY HARBOR
SELECTMEN'S MEETING AGENDA
Monday, September 28, 2020
Boothbay Harbor Town Office, 11 Howard Street
7:00 p.m.**

Due to limited space in the meeting room to meet COVID-19 guidelines for safety, we are also providing a Zoom meeting id and number to call for audio purposes:

**<https://us02web.zoom.us/j/87408447348>
MEETING ID: 874 0844 7348
TELEPHONE NUMBER: 1-929-205-6099**

CALL TO ORDER:

- Pledge of Allegiance
- Introduction of Town Manager & Board of Selectmen
- Town Manager Announcement(s)
- Town Department Reports
- Selectmen Reports
- Financials
- Minutes Approval – September 14, 2020
- Licenses
- New Business
 - a. Tom Churchill, Planning Board Chair, recommendations from Planning Board
 - b. Public Hearing-Adopt the Maine Municipal Association's new (October 1, 2020-September 30, 2021) "General Assistance Ordinance Appendix" (A-D)
- Old Business
 - a. Footbridge discussion
 - b. Fireworks (Boothbay Lights Signature Event?)
 - c. Atlantic Avenue sidewalk notice discussion
 - d. Covid-19 discussion
- Public Forum
- Warrants
- Executive Session
- Motion to Adjourn

Full Time Custodial Position

Boothbay-Boothbay Harbor Community School District

School District AOS 98 seeks a full-time custodian for the Boothbay Region schools. The successful candidate must be fingerprinted by the Department of Education, pass a fit for duty physical and will work under immediate supervision cleaning and maintaining buildings / facilities.

The deadline for applications is 3:00 P.M. Friday, October 2, 2020.

For any questions, please contact Director of Facilities, David Benner at 207-633-9870 or dbenner@aos98schools.org

Support Staff Application can be downloaded at AOS98schools.org website under Employment or can be picked up and dropped off at the Superintendent's Office between the hours of 8:00 A.M. and 4:00 P.M.

Drop off or Mail to:
Superintendent's Office
51 Emery Lane
Boothbay Harbor, ME. 04538

AOS 98 is an Affirmative Action/Equal Opportunity Employer



TOWN OF WISCASSET NOTICE OF PUBLIC HEARING

The Wiscasset Planning Board will hold a public hearing at the Wiscasset Community Center, 242 Gardiner Road, at 7 p.m. on September 28, 2020 on the following ordinance changes:

Article II, Section 1.1.1. amended to include the requirement of the Maine Uniform Building and Energy Codes (MUBEC) for all construction.

Article II, 2.12.1, amended to require a certificate of occupancy for residential structures.

Glossary: Amended definition of Home Occupation

Copies of the complete ordinance wording changes are available at the town office.

CORRECTION

TOWN OF EDGEComb MUNICIPAL OFFICERS' NOTICE OF PUBLIC HEARING ON REFERENDUM WARRANT

Notice is hereby given that the Municipal Officers of the Town of Edgecomb will hold a public hearing on Monday, September 28, 2020 at 6pm. At zoom Meeting ** in said Town to hear public comment on the following:

Referendum Warrant, October 15, 2020

Join Zoom Meeting

<https://us02web.zoom.us/j/6615898367?pwd=NE1kVlEyU1NrVTQvNGV1ZTS0JMUTO9> (map)

Meeting ID: 661 589 8367

Passcode: 639861

+1 646 558 8656 (For Dial In)

PUBLIC NOTICE TOWN OF ALNA

The Alna Board of Appeals will hold a Public Hearing regarding the letter of appeal from Jeffrey Spinney on Friday October 16, 2020 at 5:30 pm using a Zoom format. The Zoom connection information will be available in a subsequent notice or by contacting the Alna Town Clerk.

~~~~~ NOTICE ~~~~~

The Wiscasset Water District will be flushing hydrants between the weeks of Sep. 21st thru Oct. 9th, 2020. Please refrain from using the water while the crew is in your area as low water pressure and discolored water may occur.

If you have any questions, please call the Water District office at 882-6402 between the hours of 8:00 a.m. - 1:00 p.m.

Chris Cossette, Superintendent
Wiscasset Water District



PUBLIC NOTICE Town of Boothbay Harbor Board of Selectmen

7:00 p.m.

The Boothbay Harbor Board of Selectmen will hold a Public Hearing September 28, 2020, at 7:00 P.M. to adopt the Maine Municipal Association's new (October 1, 2020-September 30, 2021) "General Assistance Ordinance Appendix" (A-H).

NOTICE

Crooker Construction, LLC,
Intends to blast ledge at their Alna Quarry on
October 6th, weather permitting or on the next available
good day between the hours of 9am and 4pm.



TOWN OF WISCASSET NOTICE OF PUBLIC HEARING

The Wiscasset Planning Board will hold a public hearing at 7 p.m. on September 28, 2020 on the application of Wiscasset Solar I, LLC for the construction of a ground-mounted, 4.95 megawatt AC photo voltaic, Community Shared Solar Project. The hearing will be held at the Wiscasset Community Center, 242 Gardiner Road, Wiscasset.

Paid for by Dana Scott Page

NOTICE OF LAYOUT AND TAKING

The State of Maine by its Department of Transportation does hereby give notice to all whom it may concern:

That the Department of Transportation in accordance with the authority of Title 23 M.R.S. Section 651, has determined that public exigency requires the altering, widening, changing the grade, changing the drainage, laying out and establishing of a portion of State Highway “26” (U.S. Route 1) in the Town of Edgecomb, County of Lincoln.

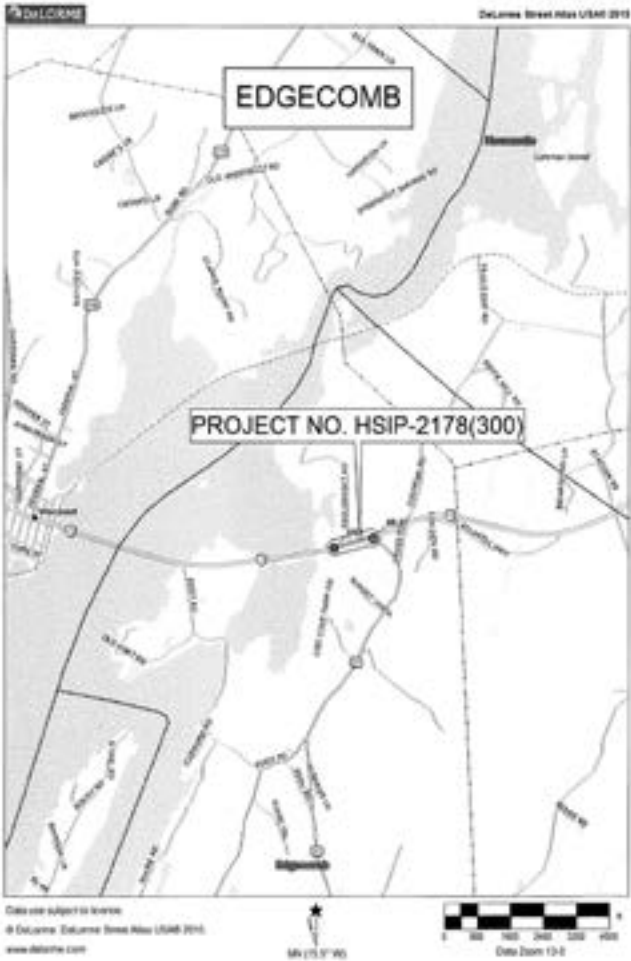
That the Department of Transportation, in accordance with Title 23 M.R.S. Sections 701 and 651, hereby lays out the location of a portion of State Highway “26” (U.S. Route 1) in the Town of Edgecomb.

That the Department of Transportation, in accordance with Title 23 M.R.S. Sections 651 and 151 to 159, has determined that public exigency requires the taking in fee simple all lands as hereinafter described, and all rights in land as specified and as shown on a Right-of-Way Map, State Highway “26” (U.S. Route 1), Town of Edgecomb, Federal Aid Project No. HSIP-2178(300), (W.I.N. 021783.00), dated April 2020, on file in the Office of the Department of Transportation, (D.O.T. File No. 8-196) and to be recorded in the Registry of Deeds of Lincoln County, a print of which is on file in the office of the County Commissioners of Lincoln County.

INFORMATIVE SUMMARY

The following is a list summarizing the parcel or item numbers, names of apparent owners of record of land and rights involved, estimated areas, and rights affected, within and adjacent to the before-referenced highway boundaries, as shown on the beforementioned right-of-way map:

Parcel/ Rights Item Bldgs. No.	Apparent Owner	Area	Slopes	Drainage	Temp. Const.	Other & Rights
1	Arthur R. Cyr Crystal M. Cyr	None	Yes	Yes	Yes	None
2	Sherrie Frisone	1649 ± Sq. Ft.	Yes	Yes	Yes	None



NOTICE OF LAYOUT AND TAKING

The State of Maine by its Department of Transportation does hereby give notice to all whom it may concern:

That the Department of Transportation in accordance with the authority of Title 23 M.R.S. Section 651, has determined that public exigency requires the altering, widening, changing the grade, changing the drainage, laying out and establishing of a portion of State Aid Highway No. 1 (Eddy Road) in the Town of Edgecomb, County of Lincoln.

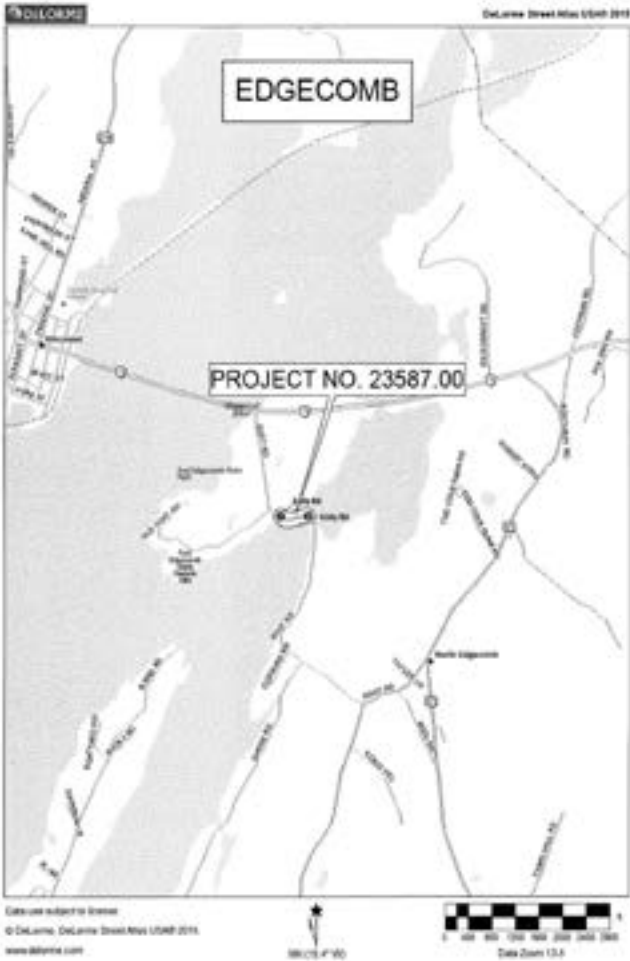
That the Department of Transportation, in accordance with Title 23 M.R.S. Sections 701 and 651, hereby lays out the location of a portion of State Aid Highway No. 1 (Eddy Road) in the Town of Edgecomb.

That the Department of Transportation, in accordance with Title 23 M.R.S. Sections 651 and 151 to 159, has determined that public exigency requires the taking of all rights in land as hereinafter specified and described and as shown on a Right-of-Way Map, State Aid Highway No. 1 (Eddy Road), Town of Edgecomb, State Project No. 23587.00, (W.I.N. 023587.00), dated February 2020, on file in the Office of the Department of Transportation, (D.O.T. File No. 8-193) and to be recorded in the Registry of Deeds of Lincoln County, a print of which is on file in the office of the County Commissioners of Lincoln County.

INFORMATIVE SUMMARY

The following is a list summarizing the parcel or item numbers, names of apparent owners of record of land and rights involved, estimated areas, and rights affected, within and adjacent to the before-referenced highway boundaries, as shown on the beforementioned right-of-way map:

Parcel/ Rights Item Bldgs. No.	Apparent Owner	Area	Slopes	Drainage	Temp. Const.	Other & Rights
1	Michael R. Warren Mark D. Warren	None	Yes	None	None	None



Owner (1st Owner, Full Name)	Owner 2 (2nd+ Owner(s), Full Name)	Mailing Address	Mailing Town	Mailing State	Mailing ZIP	Tracking Number (Used After Mailing is sent)
11 Twinrivers, LLC		11 Twin Rivers Drive	Wiscasset	ME	04578	70141200000089805876
124 Sherman House LLC		182 Craigie Street	Portland	ME	04102	701418200000089563828
1875 Lisbon Road LLC		PO Box 1915	Lewiston	ME	04240	701418200000089563804
1891 Lisbon Road LLC	Attn: David A. Tully	502 Whittier Avenue	Syracuse	NY	13204	701418200000089563705
21st Mortgage Corporation	c/o Eleanor Dominguez	PO Box 2412	South Portland	ME	04116	70141200000089826642
Aaron B. and Kathleen A. Scott		1254 Old Stage Road	Woolwich	ME	04579	70141200000089805388
Adam Bowman &	Kaylee Dickey	1043 Kennebec River Road	Embsden	ME	04958	701418200000089562067
Adrian & Nichole M. Sulea		PO Box 232	N. Anson	ME	04958	70141200000089808570
Adrian S. and Kris Jespersen-Prindle		54 Baker Road	Windsor	ME	04363	70141200000089806361
Alan and Melissa Thornton		16 Henry Lane	Whitefield	ME	04353	70141200000089826741
Alan and Penny Farrington		218 Belanger Road	Jay	ME	04239	701418200000089562944
Alan L. Aronson		167 Griffin Road	Windsor	ME	04363	70141200000089806354
Alan W. & Arlene S. Walker		26 Hilltop Road	Anson	ME	04911	70141200000089808471
Albert and Sandra Campbell		369 Farmington Falls Road	Farmington	ME	04938	701418200000089564412
Albert Hewins		24 Corvella Street	Leeds	ME	04263	701418200000089564399
Albert Lagasse		2564 Kennebec River Road	Bingham	ME	04920	70141200000089807825
Alex B. Kenoyer		40 Griffin Road	Windsor	ME	04363	70141200000089806347
Alice Smith Duncan		50 Ostego Street	Canajoharie	NY	13317	70141200000089809010
Alice Vaillancourt		205 Old Webster Road	Lewiston	ME	04240	701418200000089563606
Alicia and Timothy Huff		366 Devine Road	Whitefield	ME	04353	70141200000089826840
Allen & Rick Lessard		P.O. Box 201	Madison	ME	04950	70141200000089827748
Allen and Nancy Later		184 Ridge Road	Concord Twp.	ME	04920	70141200000089807719
Allyn and Sharon Foss		1342 Kennebec River Road	Embsden	ME	04958	70141200000089810191
Alna Town Office	c/o Sheila McCarty, Town Clerk	1574 Alna Road	Alna	ME	04535	70141200000089807092
Alternate Services Inc.		140 Canal Street	Lewiston	ME	04240	70141200000089809867
Ames Supply, Inc.		447 Bath Road	Wiscasset	ME	04578	70141200000089805869
Amy and Jeffrey Burchstead		75 Hidden Pasture Lane	Wiscasset	ME	04578	70141200000089805852
Amy and Thomas Handlon		11 Riley Street	Lewiston	ME	04240	701418200000089563798
Amy L. and Isaac L. Sidell		269 Cross Town Road	Embsden	ME	04958	701418200000089562104
Andrew Bartash		27 Overlook Drive	Buxton	ME	04093	701418200000089561695
Andrew Simoneau		292 Route 133	Wilton	ME	04294	701418200000089563330
Angela M. Latno		2107 West River Road	Sidney	ME	04330	70141200000089829216
Anita Wood		10 Oak Street	Livermore Falls	ME	04254	701418200000089563231
Ann E. Weiss Living Trust	c/o Ann E. Weiss, Trustee	403 Wiscasset Road	Whitefield	ME	04353	70141200000089826635
Anne and Karl Honkonen		238 Witchtrot Road	South Berwick	ME	03908	70141200000089828820
Anne Wheeler		118 Lothrop Road	Alna	ME	04535	70141200000089808914
Annette Tripp &	Laurie Stowe	512 Bailey Hill Road	Farmington	ME	04938	701418200000089561756
Anson Town Office	c/o Tammy Murray, Town Clerk	21 Kennebec Street	Anson	ME	04911	70141200000089807085
Anson/Madison Water District		15 Maple Street	Madison	ME	04950	70141200000089808655
Anthony and Anna Crowley		437 Pond Road	Lewiston	ME	04240	701418200000089563699
Anthony and Victoria Gajdukow		103 Soules Hill Road	Jay	ME	04239	701418200000089562937
Anthony Pranses		PO Box 330	Bingham	ME	04920	70141200000089829223
Arleen M. Masselli		341 Knowlton Corner Road	Farmington	ME	04938	701418200000089564665
Arlene Dalrymple		132 Davis Road	Farmington	ME	04938	701418200000089561701
Arnold Hamilton		250 Benton Road	Albion	ME	04910	70141200000089827199
Arthur and Anne Wilder		498 Wilder Hill Road	Norridgewock	ME	04957	70141200000089828813
Arthur and Sara Wilder		499 Wilder Hill Road	Norridgewock	ME	04957	70141200000089828806
Arthur Corson &	Mary Jane Hinkley	PO Box 89	Bingham	ME	04920	70141200000089829230
Arthur Grant and Kimberly Trider-Grant		477 Fish Street	Leeds	ME	04263	701418200000089564368
Austin Bean		1009 Route 106	Leeds	ME	04265	701418200000089562814
B.J. Goodwin		1272 Woodman Hill Road	Minot	ME	04258	701418200000089564382
Barbara Moore		46 Griffin Road	Windsor	ME	04363	70141200000089806330
Barbara S. Vanderbilt &	Richard Curewitz	85 Doyle Road	Whitefield	ME	04353	70141200000089826734
Barry & Lynette Meite		708 West Alna Road	Alna	ME	04535	70141200000089808815
Barry and Elaine Tibbetts		61 Townhouse Road	Whitefield	ME	04353	70141200000089826833
Barry and Kiyoka Grant		906 River Road	Leeds	ME	04263	701418200000089564375
Barry and Susan Gray		PO Box 353	Anson	ME	04911	70141200000089808563
Barry R. and Lynnette Miete		P.O. Box 408	Wiscasset	ME	04578	70141200000089805845
Barry R. Webster		72 Pomeroy Hill Road	Livermore Falls	ME	04254	70141200000089829865
Bath Savings Trust Company, Joy Crafts McNaughton Trustees & Herbert Crafts Marital Trust	c/o Joy McNaughton	102 Racine Avenue	Portland	ME	04103	70141200000089805838
Bayroot LLC Wagner Forest Management, Ltd		150 Orford RD	Lyme	NH	03768	70141200000089829209
Bayroot LLC Wagner Forest Management, Ltd		PO Box 33	Roxbury	ME	04275	70141200000089827229
Becky Gauthier		18 Partridge Lane	Gray	ME	04039	70141200000089809768
Bell Farms Incorporated		320 Ferry Road	Lewiston	ME	04240	701418200000089563590
Benjamin C. and Jo-Ann P. Andrews		57 Old Danielson Pike	Foster	RI	02825	701418200000089562074
Benjamin R. Turgeon		101 Bowen Road	Durham	ME	04222	701418200000089561763
Benoit Orchard LLC		1220 Sabattus Street	Lewiston	ME	04240	701418200000089563781
Bernard and Lois Hathaway		1014 Church Hill Road	Leeds	ME	04263	701418200000089564351
Bertha Hyde		69 Route 156	Wilton	Maine	04294	70141200000089806422
Bertrum & Sharon Campbell		639 Gardiner Road	Wiscasset	ME	04578	70141200000089808990
Beryl Robinson		432 East Waterman Road	Auburn	ME	04210	70141200000089828790
Betty Nichols		12 Parkview Avenue	Livermore Falls	ME	04524	70141200000089829858
Beverly and Martha Carrier		80 Pennwood Drive	Winthrop	ME	04364	70141200000089827205
Billy E. and Debra A. Bubar		1210 Embsden Pond Road	Embsden	ME	04958	701418200000089562036
Bingham Land Co.	c/o Silas Lawry	19 Great Meadow Lane	Fairfield	ME	04937	70141200000089829186
Bingham Water District		PO Box 705	Bingham	ME	04920	70141200000089807610
Birchwood Land Resources, LLC		46 Parkview Avenue	Livermore Falls	ME	04254	70141200000089829643

Owner (1st Owner, Full Name)	Owner 2 (2nd+ Owner(s), Full Name)	Mailing Address	Mailing Town	Mailing State	Mailing ZIP	Tracking Number (Used After Mailing is sent)
Blaine N. and Melissa A. Miller		1207 Kennebec River Road	Emden	ME	04958	70141820000089562050
Bowman Flying Club, Inc.		40 River Road	Livermore Falls	ME	04254	70141200000089829636
Brad A & Sara L Dube		405 Mayhew Road	Starks	ME	04911	70141200000089827731
Brad and Kathleen Barrett		PO Box 458	Bingham	ME	04920	70141200000089829193
Bradford Tuck		288 Merrill Hill Road, PO Box 148	Greene	ME	04236	70141200000089809966
Bradley and Jana Mates		77 North Line Road	Leeds	ME	04263	70141820000089564337
Brandon Laroche		29 Northwoods Circle	Hollis	ME	04042	70141820000089563323
Brenda Holske	C/O Lisa Arseneault	40 Anchors Way	Harpeswell	ME	04079	70141200000089808891
Brenda V. York		560 Farmington Falls Road	Farmington	ME	04938	70141820000089561442
Brent and Kaleigh Frye		86 Two Bridge Road	Wiscasset	ME	04578	70141200000089805821
Brett Goggin		22 Hunter Ave	Minot	ME	04258	70141200000089826970
Brian and Darcy Sukeforth		302 Dodge Road	Edgcomb	ME	04556	70141200000089805814
Brian and Cassandra Harrison		1525 Main Street	Lewiston	ME	04240	70141820000089563682
Brian D. Richards		209 Gogan Road	Benton	ME	04901	70141200000089808464
Brian Lachapelle		3 Matobian Avenue	Lewiston	ME	04240	70141820000089563583
Brian Nadeau		133 Route 202	Greene	ME	04236	70141200000089809850
Brion and Georgieanna Svenson		14 Elm Street	Salisbury	MA	01952	70141200000089828684
Brookfield White Pines Hydro, LLC.	c/o Paul Brenton	200 Donald Lynch Boulevard - Suite 300	Marlborough	MA	01752	70141200000089807757
Bruce A. & Carolyn M. Boyker		535 Bailey Hill Road	Farmington	ME	04938	70141820000089564658
Bruce A. and Eva K. Thompson		P.O. Box 647	Livermore	ME	04253	70141820000089563224
Bruce and Crystal Manzer		32 Barton Hill Road	Anson	ME	04911	70141200000089808662
Bruce and Evelyn Beane		PO Box 684	Bingham	ME	04920	70141200000089829179
Bruce and Janet Eastman		162 Belanger Road	Jay	ME	04239	70141820000089562920
Bruce and Lorelle Bruhn		438 Town Farm Road	Farmington	ME	04938	7017100000074671669
Bruce and Stacey Tupper		118 Valley Road	Raymond	ME	04021	70141200000089829162
Bryan Cassidy		45 Pinewoods Road	Lewiston	ME	04240	70141820000089563774
Byron Posser and Dorothy Posser-Small		224 Dudley Corner Road	Skowhegan	ME	04976	70141820000089561718
Byron and Kathleen Kelch		493 West River Road	Palatka	FL	32177	70141200000089826628
Byron and Lovina Norton		134 Griffin Road	Windsor	ME	04363	70141200000089806323
Byron Staples		158 Owen Mann Road	Farmington	ME	04938	7017100000074673816
Caitlin Kennedy		PO Box 327	Anson	ME	04911	70141200000089808556
Caleb Dionne		11 School Street	Farmington	ME	04938	70141820000089563316
Candace and Joseph Loring		PO Box 805	Yarmouth	ME	04096	70141200000089810108
Caratunk Town Office	c/o Town Clerk	90 Main Street	Caratunk	ME	04925	70141200000089807078
Carl & Lori Urquhart		46 Lothrop Road	Alna	ME	04535	70141200000089808808
Carl A. & Carol J. Andersom		PO Box 301	Anson	ME	04911	70141200000089808457
Carl B. Erickson Jr.		868 Atlantic Highway	Waldoboro	ME	04572	70141200000089805371
Carl Bucciantini		37 Buzzell Lane, PO Box 352	Greene	ME	04236	70141200000089809751
Carl Perkins Jr.		PO Box 415	Bingham	ME	04920	70141200000089829155
Carl Richardson		190 Mountain	Raymond	ME	04071	70141200000089807702
Carlene Spencer		P.O. Box 813	Newport	VT	05855	70141820000089561879
Carlton Furbush		28 Packard Road	Greene	ME	04236	70141200000089809942
Carmine and Lindsay Nile		235 More Acres Road	Wilton	ME	04294	70141820000089564344
Carmine and Lindsay Nile		425 Fish Street	Leeds	ME	04263	70141820000089564313
Carol J. and Mark S. Verrill	c/o Carol Verrill	18 Deer Ridge Road, Apartment C8	Wiscasset	ME	04578	70141200000089805364
Caroline Hood &	George Jenckes	260 Davis Road	Farmington	ME	04938	70141820000089564610
Carolyn A. Murray		35 Karn Road	Livermore Falls	ME	04254	70141200000089829612
Carrabec High School		PO Box 220	N. Anson	ME	04958	70141200000089808648
Carric and Leo Beane		PO Box 612	N. Anson	ME	04958	70141200000089808549
Carroll Lavallee		PO Box 302	Bingham	ME	04920	70141200000089829148
Caryn and James Smart		132 Copper Ridge Road	Greene	ME	04236	70141200000089809843
Cascade Land Holdings Inc.		PO Box 1363	Auburn	ME	04211	70141820000089564641
Castonguay Living Trust	c/o Roger and Kathleen Castonguay, Trustees	10 Brookside Drive	Lewiston	ME	04240	70141820000089563675
Catherine Cyrus	c/o Holly C. Zeeb, Trustee	36 Longfellow Avenue	Brunswick	ME	04011	70141200000089826727
Cathryn J. and Jody Tyler		21 Merrill Lane	Durham	ME	04222	70141820000089561930
Cecil Foss &	Bertha Hyde	67 Route 156	Wilton	ME	04294	70141200000089807924
Central Maine Power Company		83 Edison Drive	Augusta	ME	04336	70141200000089810184
Central Maine Power Company	c/o Avangrid Mgmt Co - Local Tax	One City Center - 5th Floor	Portland	ME	04101	70141200000089810177
Chad H. Bradbury		1180 Route 2	Rumford	ME	04276	70141200000089808426
Charles & Diane Sonos		34 Parkview Avenue	Livermore Falls	ME	04254	70141200000089829605
Charles & Vickie Morris		507 Monroe Road	Winterport	ME	04496	70141200000089827076
Charles and Gloria Nye		67 High Street	Saco	ME	04072	70141820000089563576
Charles and Sharyn Peabody		3 Lake Moxie Road	The Forks	ME	04985	70141200000089828783
Charles B. Barker		155 Fish Street	Leeds	ME	04263	70141820000089564320
Charles Cloutier		355 Patten Road	Greene	ME	04236	70141200000089809744
Charles E. and Sharon W. Ferguson		34 Baker Road	Windsor	ME	04363	70141200000089806316
Charles J. Carpenter, Jr		P.O. Box 2233	Skowhegan	ME	04967	71041200000089827724
Charles Landry		18 Preble Avenue	N. Anson	ME	04958	70141200000089808624
Charles S. H. Hubbard &	Holly Barron	438 Webster Road	Farmington	ME	04938	70141820000089561725
Charles Springer		1271 Old Stage Road	Woolwich	ME	04579	70141200000089805357
Cheryl D. Barkow		271 Osborne Road	Farmington	ME	04938	70141820000089564627
Chesterville Town Office	c/o Pamela Adams, Town Clerk	409 Dutch Gap Road	Chesterville	ME	04938	70141200000089807092
Chewonki Foundation Inc.		485 Chewonki Neck Road	Wiscasset	ME	04578	70141200000089805807
Chris B. Leeman		PO Box 411	Farmington	ME	04938	70141820000089564634
Christian Boucher and Kelsey Rodrigue		6 West View Drive	Lewiston	ME	04240	70141820000089563767
Christopher Olson		2057 Clifton Avenue	Chicago	IL	60614	70141200000089809003
Christopher Vinciere and Hollye Dunphy		PO Box 112	N. Anson	ME	04958	70141200000089808532
Chuck Starbird		32 Lewiston Street	Lewiston	ME	04240	70141820000089563668

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Cindy Baker		P.O. Box 363	North Anson	ME	04958	70141820000089562029
City of Auburn	c/o Susan Clements-Dallaire, City Clerk	60 Court Street	Auburn	ME	04210	70141200000089807054
Clara Neal		PO Box 85	New Gloucester	ME	04260	70141200000089828585
Clare Liwiski		808 Farmington Falls Road	Farmington	ME	04938	70141820000089561572
Claude E. & Susan M. Ducloux		3512 Native Dancer Cove	Austin	TX	78746	70141820000089561589
Claudette Stewart		210 Ferry Road	Lewiston	ME	04240	70141820000089563569
Clay A. Adams		92 Dutton Hill	Gray	ME	04039	70141820000089564504
Clayton E. Andrews Jr. Revocable Trust	c/o Clayton E. Andrews III, Trustee	356 Beckwith Road	Corville	ME	04976	70141820000089564993
Clement Lemieux		15 Larry Drive	Lewiston	ME	04240	70141820000089563750
Cliff and Michelle Stevens		211 Ferry Street	Solon	ME	04979	70141200000089827175
Clinton & Diane Delano		16 Birch Point Road	West Bath	ME	04530	70141200000089826963
Commissioners of Androscoggin County	c/o Larry Post, County Administrator	2 Turner Street	Auburn	ME	04210	70141200000089807047
Commissioners of Cumberland County	c/o James Gailey, County Manager	142 Federal Street	Portland	ME	04101	70141200000089807030
Commissioners of Franklin County	c/o Julie Magoon, County Clerk	140 Main Street	Farmington	ME	04938	70141200000089807023
Commissioners of Kennebec County	c/o Robert Devlin, County Administrator	125 State Street - 2nd Floor	Augusta	ME	04330	70141200000089807016
Commissioners of Lincoln County	c/o Carrie Kipfer, County Administrator	32 High Street - PO Box 249	Wiscasset	ME	04578	70141200000089807009
Commissioners of Sagadahoc County	c/o Pam Hile, County Administrator	752 High Street	Bath	ME	04530	70141200000089806996
Commissioners of Somerset County	c/o Dawn DiBlasi, County Administrator	41 Court Street	Skowhegan	ME	04976	70141200000089806989
Conroy Development	Attn: Terry Conroy Jr.	800 Technology Center Drive	Stoughton	MA	02072	70141200000089829124
Corey A. and Nicole A. Bouyea		625 Stackpole Road	Durham	ME	04222	70141820000089561770
Corey and Michele Morris		994 Church Hill Road	Leeds	ME	04263	70141820000089564036
Country Lane Corporation		P.O. Box 3346	Auburn	ME	04240	70141820000089563651
Craig and Brenda Barton		61 Shaker Road	Gray	ME	04039	70141200000089827069
Craig and Julie Maxim		35 Collins Road	Chelsea	ME	04330	70141200000089829131
Craig and Roberta Carter		2588 Kennebec River Road	Concord Twp.	ME	04920	70141200000089807603
Craig and Sarah Lapine		916 Lawrence Road	Pownal	ME	04069	70141200000089828578
Craig Carl		23 Meadow Street	Bingham	ME	04920	70141200000089829100
Craig Macdonald		51 Rider Bluff Road	Holden	ME	04429	70141200000089807795
Craig McNear		8 McNear Loop	Leeds	ME	04263	70141820000089564290
Craig N. Pomerleau		12 Rose Ridge	Jay	ME	04239	70141820000089563217
Craig P. and Dona M. Sickels		1039 Durham Road	Durham	ME	04222	70141820000089561862
Dale Marston Family Trust	c/o William Marston and Paula Wing, Trustees	37 McArthur Avenue	Lewiston	ME	04240	70141820000089564313
Dale R. Adams		9 River Road	Livemore Falls	ME	04254	70141200000089829582
Dale Verrill		PO Box 299	South Paris	ME	04281	70141200000089809935
Dana and Jean Elie		159 Old Webster Road	Lewiston	ME	04240	70141820000089563552
Dana Bradstreet		19 Stackpole Road	Durham	ME	04222	70141820000089561923
Dana L. and Kelly M. Busler		232 Fowle Hill Road	Wiscasset	ME	04578	70141200000089805791
Dana W. & Narcisa B. Bealieu		14 Hilltop Road	Anson	ME	04911	70141200000089808433
Daniel & Kathleen Allen		17 Fairfield Avenue	Westbrook	ME	04092	70141200000089827168
Daniel B. & Lillian C. Bagley		704 Bailey Hill Road	Farmington	ME	04938	70141820000089561541
Daniel L. Belanger		118 Griffin Road	Windor	ME	04363	70141200000089806309
Daniel M. Brown		PO Box 117	N. Anson	ME	04958	70141200000089808631
Daniel P. and Juli Colby		P.O. Box 125	Wiscasset	ME	04578	70141200000089805784
Daniel Samson		PO Box 1681	Lewiston	ME	04241	70141820000089563743
Daria Goggins		28 West View Drive	Lewiston	ME	04240	70141820000089563644
Darrel Fournier		3 Fournier Drive	Freeport	ME	04320	70141200000089826956
Darrin C. and Sandra J. Weaver		255 Coopers Mills Road	Windor	ME	04363	70141200000089806293
Daryn O. Chase		267 Knowlton Corner Road	Farmington	ME	04938	70141820000089561558
David & Linda Abbott		1116 West Alna Road	Alna	ME	04535	70141200000089808907
David and Abbe Chabot		65 Packard Road	Greene	ME	04236	70141200000089809836
David and Derek Bisson		41 Pride Road	Auburn	ME	04210	70141820000089563545
David and Holly Cote		P.O. Box 17	Whitefield	ME	04353	70141200000089826826
David and Josephine Boutilier		575 Buzzell Road	Acton	ME	04001	70141820000089561565
David and Melinda Gilmore (Trustees)		214 Rocky Hill Road	Rohoboth	MA	02769	70141820000089562913
David and Paula Ward		111 Pomeroy Hill Road	Livemore Falls	ME	04254	70141200000089829599
David and Tammy Noyes		15 Riley Street	Lewiston	ME	04240	70141820000089563736
David Barker		9 Barker Road	Leeds	ME	04263	70141820000089564276
David Bartlett		93 Bartlett Road	Jay	ME	04239	70141820000089563309
David Curtis		199 Old Webster Road	Lewiston	ME	04240	70141820000089563637
David E. Taylor Revocable Trust	c/o David Taylor, Trustee	PO Box 854	Vineyard Haven	MA	02568	70141820000089561435
David Ela		51 Parkwoods Drive	Anson	ME	04911	70141200000089808525
David Emerson		2235 Alna Road	Alna	ME	04535	70141200000089808792
David F. Marshall &	Kevin Vining	38 Sentry Hill Road	York	ME	03909	70141820000089561527
David Hardman		10 Nilsen Lane	Whitefield	ME	04353	70141200000089826611
David Hooker		137 Willard Road	New Ipswich	NH	03071	70141200000089808440
David M. and Kathy L. Tome		P.O. Box 219	Bowdoinham	ME	04008	70141820000089564795
David M. and Theresa Magnusen		23 Rooney Lane	Whitefield	ME	04353	70141200000089826710
David R. Dimick		836 Stackpole Road	Durham	ME	04222	70141820000089561787
David Turmenne		25 Peter Boulevard	Lewiston	ME	04240	70141820000089563538
David W. and Jeanne M. Lincoln		808 Stackpole Road	Durham	ME	04222	70141820000089561855
Dawn Hilliard		32 Corvella Street	Leeds	ME	04263	70141820000089564269
Dead River Company		82 Running Hill Road - STE 400	South Portland	ME	04106	70141820000089563729
Dean and Stacie Santomango		121 Todd Road	Greene	ME	04236	70141200000089809737
Dean E. and Melissa S. Baker		22 Moulton Road	Embsen	ME	04958	70141820000089564511
Deanna and Donald Ridley		146 Davis Road	Farmington	ME	04938	70141820000089561534
Deanne Crocker		P.O. Box 98	Whitefield	ME	04353	70141200000089826819
Deborah Drinkwater		925 River Road	Leeds	ME	04263	70141820000089564252
Deborah L. King		28 King Road	Windor	ME	04363	70141200000089806286

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Deborah Sawyer	c/o Jonathan Morris	28 Durham Road	Pownal	ME	04069	70141200000089828561
Deborah Wourms &	Nancy Deyrup	207 Bowie Avenue	Lake Placid	FL	33852	70141820000089564245
Debra Churchill		676 West Alna Road	Alna	ME	04535	70141200000089808983
Debra Hall		PO Box 228	Bingham	ME	04920	70141200000089829117
Debra J. Rioux		408 Upper Street	Turner	ME	04282	70141200000089809928
Debra L. Oliver		758 Stackpole Road	Durham	ME	04222	70141820000089561916
Debra S. Moreau		31 Rose Road	Greene	ME	04236	70141200000089809829
Delwin J. and Jacqueline L. Punneo		63 Androscoggin Bluffs	Livermore Falls	ME	04254	70141200000089829575
Denis and Lisa Jean		48 Larabee Road	Lewiston	ME	04240	70141820000089563620
Dennis and Gay Gallant		P.O. Box 66	Bowdoinham	ME	04008	70141200000089806309
Dennis and Judith Morgan		297 Grove Street	Lewiston	ME	04240	70141820000089563521
Dennis and Karen Couture		49 East Jay Road	Jay	ME	04239	70141820000089563002
Dennis and Nancy Dube		65 Cotton Road	Lewiston	ME	04240	70141820000089563712
Dennis J. Ruel		P.O. Box 274	Windsor	ME	04363	70141200000089806262
Dennis R and Janet Binns		509 Townhouse Road	Whitefield	ME	04353	70141200000089826604
Descendants Trust	c/o Raymond Fortin	13 Russell Road	Madison	ME	04950	70141200000089810160
Deutsche Bank National Trust	c/o Owen Loan Servicing Company	1661 Worthington Road, Suite 100	West Palm Beach	FL	33409	70141200000089809720
Devises of Roger B Williams	c/o Roger B. Williams II	44 Forest Trail	Turner	ME	04282	70141820000089561435
Diane Blood		68 Hopson Avenue	Branford	CT	06405	70141200000089827052
Diane Buckley		PO Box 722	Bingham	ME	04920	70141200000089807696
Dillon M. Ross		3 Rose Ridge	Jay	ME	04239	70141820000089563200
Don F. Pease		39 Claybrook Road	Jay	ME	04239	70141820000089563293
Don Leon Pillsbury		300 Whittier Road	Farmington	ME	04938	70141820000089561657
Donald & Anne M Jarvinen		795 Congress Street	Duxbury	MA	02332	70141200000089827717
Donald and Celine Arel		50 Old Farm Road	Lewiston	ME	04240	70141820000089563613
Donald and Donna Jacobs		16 Rose Road	Greene	ME	04236	70141200000089809713
Donald and Raclene Vosmus		199 Fickett Road	Pownal	ME	04069	70141200000089828554
Donald and Sylvie Jacques		866 College Street	Lewiston	ME	04240	70141820000089563514
Donald and Virginia Parent		85 Route 202	Greene	ME	04236	70141200000089809614
Donald B. Fetterhoff		P.O. Box 502	West Farmington	ME	04992	70141820000089564771
Donald Bernier		PO Box 366	Topsham	ME	04086	70141820000089564238
Donald D. and Lois G. Morey, Trustees		5 Philbrick Lane	Whitefield	ME	04353	70141200000089826703
Donald E. Joslyn &	Lovina Norton	107 Dinsmore Road	Sidney	ME	04330	70141200000089806255
Donna Plourde		25 Parkwoods Drive	Anson	ME	04911	70141200000089807597
Donna Tracy		390 Titcomb Hill Road	Farmington	ME	04938	70141820000089562807
Donna Wallace		2271 Alna Road	Alna	ME	04535	70141200000089808884
Douglas & Denise McKeown		446 Back Road	Shapleigh	ME	04076	70141200000089827151
Douglas A. and Evelyn A. Kinney		102 Duncan Road	Jefferson	ME	04348	70141200000089826796
Douglas A. Boucher &	Mary Jane Mullen	28 Champa Road	Billerica	MA	01821	70141200000089827601
Douglas and Brenda Kirk		114 Campbell Road	Leeds	ME	04263	70141820000089564221
Douglas and Pamela Schlichting &	Willow Schwarz	75 Joseph Mains Road	Woolwich	ME	04579	70141200000089828547
Douglas G. Robinson &	Danielle M. Turner	285 Griffin Road	Windsor	ME	04363	70141200000089806248
Douglas L. Rollins		17 River Road	Livermore Falls	ME	04254	70141200000089829568
Douglas M. & Cathy E. Sears		23 Horseback Road	Anson	ME	04911	70141200000089808419
Dr. Michael & Laura Rifkin		74 North Line Road	Greene	ME	04236	7017100000074673984
Duane L. Norris		290 Plaisted Road	Jay	ME	04239	70141820000089562999
Durham Town Office	c/o Becky Taylor-Chase, Town Clerk	630 Halliwell Road	Durham	ME	04222	70141200000089806972
Durrell K. Jackson		PO Box 512	West Farmington	ME	04992	70141820000089561640
Dwight A. & Cynthia Oakes		488 Wiscasset Road	Whitefield	ME	04353	70141200000089826598
Dylan Coutts		28 Julian Lane	Windsor	ME	04363	70141200000089806231
Earl and Katherine Blanchard		305 Tyler Road	Windsor	ME	04363	70141200000089807788
Earl Hardy		PO Box 623	Farmington	ME	04938	70141820000089561596
Earl Hardy		P.O. Box 623	Farmington	ME	04938	70141200000089828677
Earle Bubier, Jr.		PO Box 411	Greene	ME	04236	70141820000089564214
Earle W. and Wanda M. Bonney		53 Hillman Ferry Road	Livermore Falls	ME	04254	70141200000089829551
Edgar E. Davis		372 Farmington Falls Road	Farmington	ME	04938	70141820000089561664
Edmond Turmenne Heirs	C/o Robert Turmenne	8 White Oak Drive	Plymouth	MA	02360	70141820000089563507
Edward A. and Linda L. Bleile		110 Foye Road	Wiscasset	ME	04578	70141200000089805760
Edward A. and Susan Karass		10797 North Blazing Star Lane	Boise	ID	83712	70141200000089826680
Edward and Dianne Devault		2 Fletcher Mountain Road	Concord Twp.	ME	04920	70141200000089807689
Edward and John Bartlett		123 High Street	South Paris	ME	04281	70141820000089563194
Edwin and Miriam Bard		903 River Road	Leeds	ME	04263	70141820000089564207
El Carrier, Inc.		PO Box 489	Jackman	ME	04945	70141200000089807931
Elaine Dumais		228 Dyer Road	Lewiston	ME	04240	70141200000089809515
Elizabeth M Oliver, Heirs	c/o Connie Oliver	133 Fahi Pond Road	N. Anson	ME	04958	70141200000089808310
Elliot Conte		2274 Alna Road	Alna	ME	04535	70141200000089808778
Elwood E. and Joanne Leighton		10 Karn Road	Livermore Falls	ME	04254	70141200000089829742
Elwyn McArthur		12 Cloverleaf Lane	Winthrop	ME	04364	70141820000089564191
Elwyn McArthur		32 Morris Avenue	Leeds	ME	04263	70141820000089564184
Embden Town Office	c/o Christy Jablon, Town Clerk	809 Embden Pond Road	Embden	ME	04958	70141200000089806965
Emery P. Smith &	Cynthia St. Peter	244 South Hunts Meadow Road	Whitefield	ME	04353	70141200000089826802
Eric and Chrissy Cox		370 Old Greene Road	Lewiston	ME	04240	70141200000089809416
Eric Brown		619 Bishop Hill Road	Leeds	ME	04263	70141820000089564177
Eric C. Bowie		636 Stackpole Road	Durham	ME	04222	70141820000089561794
Eric R. & Catherine M. Benson		1202 Poplar Hill Road	Baltimore	MD	21210	70141200000089827595
Eric S. and Denise Rodzen		84 Parkview Avenue	Livermore Falls	ME	04254	70141200000089829735
Erickson & Ralph, Inc.		868 Atlantic Highway	Waldoboro	ME	04572	70141200000089805340
Ernest and Nancy Sylvester		561 Fish Street	Leeds	ME	04263	70141820000089564160

Owner (1st Owner, Full Name)	Owner 2 (2nd+ Owner(s), Full Name)	Mailing Address	Mailing Town	Mailing State	Mailing ZIP	Tracking Number (Used After Mailing is sent)
Ernest W. Hall		P.O. Box 347	Dryden	ME	04225	70141820000089563187
Errol and Kathleen Additon		1105 Church Hill Road	Leeds	ME	04263	70141820000089564153
Estate of Allen Richard Leech		PO BOX 167	Bowdoinham	ME	04008	70141200000089826949
Estate of Leon E. Seamon	c/o Dawn Seamon, Trustee	509 Franklin Road	Jay	ME	04239	70141820000089563088
Estate of Rudolph E. Boute	c/o Helen Boute	21 Claybrook Road	Jay	ME	04239	70171000000074671638
Eugene W. And James W. Kelley		226 Atlantic Avenue	Boothbay Harbor	ME	04538	70141200000089826581
Faith Carman		118 Davis Road	Farmington	ME	04938	70141820000089561459
Farmington Town Office	c/o Leanne Dickey, Town Clerk	153 Farmington Falls Road	Farmington	ME	04938	70141200000089806958
Farmington Village Corporation		PO Box 347	Farmington	ME	04938	70141820000089561633
Ferry Road Development Co., LLC		485 West Putnam Avenue	Greenwich	CT	06830	70141200000089805753
Flanagan-Sheehan Family Trust	c/o Andrew Flanagan, Trustee	1132 Eagle Lake Road	Bar Harbor	ME	04958	70141820000089564528
Florence Jennings Estate	c/o Rick Jennings	72 Quaker Ridge Road	Leeds	ME	04263	70141820000089564146
Forrest & Holly Rollins		35 Burns Road	Moscow	ME	04920	70141200000089829094
Frances G. Hutchings Revocable Trust	C/O Frances G Hutchins Trustee	PO Box 123	Newcastle	ME	04553	70141200000089808976
Francis & Sandra Kollar		380 Russell Road	Skowhegan	ME	04976	70141200000089808211
Francis and Jolene Andre		PO Box 7	Leeds	ME	04263	70141820000089564139
Francis Duggan		30 B Lincoln Road	Newton	MA	02458	70141200000089827588
Franciscan Fathers		65 High Street	Sabattus	ME	04280	70141200000089809706
Frank Boudin		17 Boudin Road	Wiscasset	ME	04578	70141200000089808877
Frank T. Conner		1069 Durham Road	Durham	ME	04222	70141820000089561848
Franklin A. Russell &	Robyn R. Kremer	869 Mayhew Road	Starks	ME	04911	70141200000089827571
Fraternity Hall Assoc. LTD		PO Box 355	N. Anson	ME	04958	70141200000089808402
Fred W. Bragdon, Jr.		152 Foye Road	Wiscasset	ME	04578	70141200000089805746
Frederick Hardy	c/o Ruth L. Hardy	887 Weeks Mills Road	New Sharon	ME	04955	70141200000089828660
Freitas Revocable Trust	c/o Antonio Freitas, Trustee	55 Sheehan Street	Stoughton	MA	02072	70141200000089827564
Gaeton and Patrick Bolduc		91 Saunders Road	Greene	ME	04236	70141200000089809607
Gail C. and Hallis A. Thayer		778 Wiscasset Road	Whitefield	ME	04353	70141200000089826697
Gail Lange		65 Shaw Hill Road	Industry	ME	04938	70171000000074673908
Garry J. & Gloria Livingston		PO Box 37	N. Anson	ME	04958	70141200000089808303
Gary and Jacquelyne Callahan		P.O. Box 145	Windsor	ME	04363	70141200000089806224
Gary and Joy Buzzell		PO Box 143	Greene	ME	04236	70171000000074673977
Gary and Rebecca Kenney		245 Bert Berry Road	Embsden	ME	04958	70141820000089564979
Gary and Yvette Landry - Life Estate		166 Campground Road	N. Anson	ME	04958	70141200000089808204
Gary Barker		2455 Stone Watch Boulevard	John's Island	SC	29455	70141200000089808778
Gary Barker		2466 Stone Watch Boulevard	John's Island	SC	29455	70141200000089808969
Gary Jaskalen		146 Karm Road	Livermore Falls	ME	04254	70141200000089829629
Gary L. & Linda F. Grand		1544 Cross Hill Road	Vassalboro	ME	04989	70141200000089827045
Gary Stewart &	Jonathan Newell	66 Park Street	Madison	ME	04950	70141200000089827144
Gaynelle Yeaton		262 Whittier Road	Farmington	ME	04938	70141820000089564818
GCO Minerals Co.	c/o Bob Tobermann	6400 Poplar Avenue	Memphis	TN	38197	70141820000089564122
Gene D. and Pamela R. Tweedie		713 Mayhew Road	Starks	ME	04911	70141200000089827540
George & Margaret Ricker		165 Falmouth Road	Windham	ME	04062	70141200000089808860
George and Mary Ann Hall		822 Townhouse Road	Whitefield	ME	04353	70141200000089826789
George and Myrtle Taylor		18 Parkview Avenue	Livermore Falls	ME	04524	70141200000089829711
George and Noreen Cummings		20 Haines Corner Road	Livermore Falls	ME	04254	70141200000089829704
George and Patricia Allen		P.O. Box 318	Livermore Falls	ME	04254	70141200000089829698
George and Susan Viscarelli		77 Pinewoods Road	Lewiston	ME	04240	70141820000089563491
George E. Jones		57 Lomie River Road	Jay	ME	04239	70141200000089829681
George Schott		PO Box 9340	Auburn	ME	04210	70141200000089809690
George W. Cummings, Jr.		2285 Marsh Hawk Lane, Apartment 19036	Fleming Island	FL	32003	70141200000089829674
George W. Hall, Jr. &	Harold Piacopolos	822 Townhouse Road	Whitefield	ME	04353	70141200000089826369
Gerald and Valerie Harford		218 Jennings Road	Leeds	ME	04263	70141820000089564115
Gerald B. Sr. and Virginia A. Burgess		587 Route 219	Leeds	ME	04263	70141820000089564108
Gerald H. Durrell		26 Clearwater Road	New Sharon	ME	04955	70141200000089828653
Gerald O. Thompson, Jr.		138 Turner Street	Canton	ME	04221	70141820000089563170
Gerard and Debra Breton		816 East Jay Road	Jay	ME	04239	70141820000089563071
Gerard and Louise Richard		9 Riley Street	Lewiston	ME	04240	70141200000089809508
Gerard and Susan Chretien		434 Park Street	Livermore Falls	ME	04254	70141200000089829667
Gerard M. Fitzgerald		303 Coopers Mills Road	Windsor	ME	04363	70141200000089806217
Gilbert Durrell		1156 Industry Road	Industry	ME	04938	70141820000089563408
Gilbert Gray &	Madelene Jasmin	275 Old North Berwick Road	Lyman	ME	04002	70141200000089829087
Gina L. Dubord		76 Parkview Avenue	Livermore Falls	ME	04254	70141200000089829650
Glen and Gloria Durrell		463 Davis Road	Farmington	ME	04938	70141820000089561619
Glenn and Claudia Viles		P.O. Box 135	North Anson	ME	04958	70141820000089564788
Gloree and Gayle Rollins		PO Box 63	Bingham	ME	04920	70141200000089807580
Gloria Chartier &	Donna Plourde	27 Parkwoods Drive	Anson	ME	04911	70141200000089808396
Gordon O'Donnell	C/O Elegant Homes	885 Portland Road	Saco	ME	04072	70141200000089808761
Greene Town Office	c/o Charles Noonan, Town Clerk	2230 Main Street	Greene	ME	04236	70141200000089806941
Greg Cederlund		28 Trails End	Freeport	ME	04032	70141200000089826383
Gregory Adams		118 River Road	Avon	ME	04966	70141820000089561602
Gregory and Ellen Giberson		7 Franklin Street, Apt A	Brunswick	ME	04011	70141200000089807771
Gregory and Meghan Hind		165 Dyer Road	Lewiston	ME	04240	70141200000089809409
Gregory D. and Daryl Hodgkins &	Cheryl Sawyer	645 Wiscasset Road	Whitefield	ME	04353	70141200000089826574
Gregory J. Donovan		59 Homestead Road	Starks	ME	04911	70141200000089827557
Gregory M. and Lisa J. Hart		11 Crockier Avenue North	Whitefield	ME	04353	70141200000089826352
Greta M. Essency		272 Knowlton Corner Road	Farmington	ME	04938	70141820000089564825
Guy Pilote		448 Old Greene Road	Lewiston	ME	04240	70141820000089563484
Guy Pilote and Jeannine Pilote-Cote		436 Old Greene Road	Lewiston	ME	04240	70141200000089809492

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Gwen Hammond		30 Bruschi Road	Windham	ME	04062	70141200000089808945
Hallis A. Thayer, II		7 Petticoat Acres Lane	Whitefield	ME	04353	70141200000089826390
Hamiltons of Waterborough	c/o James Hamilton	PO Box 158	South Casco	ME	04077	701418200000089564009
Hannah C. and Michael A. Cayer		371 Coopers Mills Road	Windsor	ME	04363	70141200000089806200
Hannah J. and David B. Hall		35 Cloutier Road	Durham	ME	04222	701418200000089561909
Harold E. Price		16 Pearl Street	Madison	ME	04950	70141200000089827533
Harry A. Higgins		16 East Jay Road	Jay	ME	04239	7017100000074674080
Harry John and Mary Ann Booth		26 Griffin Road	Windsor	ME	04363	70141200000089806194
Harvey and Lisa Lafreniere		238 Strickland Loop Road	Livermore Falls	ME	04254	70141200000089829841
Hayden Family Trust		398 Anson Road	Starks	ME	04911	70141200000089827526
Heather and Kevin Theriault		190 Chute Road	Windham	ME	04062	70141200000089827809
Heather Burr		228 Middle Road	Cumberland	ME	04021	70141200000089810139
Heather L. Pennings		38 Mountain Road	Wiscasset	ME	04578	70141200000089805739
Heirs of Alex Jolicoeur		14 Sawyer Road	Greene	ME	04236	701418200000089563903
Heirs of Ruth S. Benjamin	c/o William Sylvester, PR	1128 Riverside Drive	Auburn	ME	04210	70141200000089808051
Hellen Dancer		P.O. Box 234	Whitefield	ME	04353	70141200000089826567
Henry Hardy		360 Weeks Mills Road	Farmington	ME	04938	701418200000089561626
Herbert and Josephine Robertson		241 Strickland Loop Road	Livermore Falls	ME	04254	70141200000089829834
Herbert Jordan Jr		10 Acorn Lane	Lewiston	ME	04240	70141200000089809393
Herbert L. York		560 Farmington Falls Road	Farmington	ME	04938	701418200000089564894
Howard S. Brower		P.O. Box 242	Lincoln	MA	01773	70141200000089827519
Hugh and Michael Campbell &	Jerry Simpson	272 Morrison Hill Road	Farmington	ME	04938	701418200000089564528
Hunter D. Williams		636 River Road	N. Anson	ME	04958	70141200000089808297
Hyltun Farm Irrevocable Trust		8 Olde Ferry Road	Starks	ME	04911	70141200000089827472
Imelda Yorkus		594 Vigue Road	Whitefield	ME	04353	70141200000089826345
Industry Town Office	c/o Angelina G. Davis, Town Clerk	1033 Industry Road	Industry	ME	04938	70141200000089806934
Inhabitants of the Town of Bingham		PO Box 652	Bingham	ME	04920	70141200000089807672
Ira G. Day		53 Old Waterville Road	Oakland	ME	04963	70141200000089827465
Irene and George Wright		220 North Daggett Hill RD	Greene	ME	04236	70141200000089809591
J&D Associates	c/o David Rich	54 Terrace Road	Auburn	ME	04240	701418200000089563477
Jacqueline and George Kiger, Jr.		16 Murphy Road	Embsden	ME	04958	701418200000089564962
Jacqueline Morrill		129 Coopers Mills Road	Windsor	ME	04363	70141200000089806187
Jai St. Peter		PO Box 367	Anson	ME	04911	70141200000089808198
James & Barbara Russell		31 Dumas Avenue	Hampton	NH	03842	70141200000089808389
James & Jaimie-Lee Bailey		2263 Alna Road	Alna	ME	04535	70141200000089808853
James & Veronica Wright		1014 West Ridge Road	Cornville	ME	04976	70141200000089826932
James A. Brown Living Trust	c/o J.A. and L.E. Brown	319 Hollowtree Drive	Seffner	FL	33584	701418200000089561800
James A. Hall		472 West Alna Road	Alna	ME	04535	70141200000089808754
James and Ann Silin		17 Gorman Lane	Whitefield	ME	04353	70141200000089826406
James and Bernadette Papi		343 Old Greene Road	Lewiston	ME	04240	70141200000089809485
James and Betty Cody &	Bernadette Christen	22 Locust Street	Madison	ME	04950	70141200000089827038
James and Chantal Jacques		313 Plaisted Road	Jay	ME	04239	701418200000089563163
James and Constance Winder		49 Church Street	Old Orchard Beach	ME	04064	70141200000089827458
James and Nancy Biseti		74 Island View Drive	Greene	ME	04236	7017100000074673960
James and Robin Jordan		387 Webster Road	Farmington	ME	04938	701418200000089564832
James Beane	c/o Joan Marden	28 Old Canada Road	Bingham	ME	04920	70141200000089807832
James C. and Judith L. Main		332 Willow Lane	Wiscasset	ME	04578	70141200000089805722
James Clark and Michelle Mason		256 Grove Street	Lewiston	ME	04240	70141200000089809386
James D. Guthrie Jr		217 Fitzgerald Road	Rindge	NH	03461	70141200000089827441
James Howe &	James Cutting Sr.	170 Keay Road	Sabattus	ME	04280	70141200000089807573
James M. Bonney, Jr.		9 Center Road	Livermore	ME	04253	70141200000089829827
James P. Vicneire, Sr.		119 Grumpy Men Avenue.	N. Anson	ME	04958	70141200000089808280
James R. and Dawn Marie Fahey		296 Cumberland Street	Westbrook	ME	04092	70141200000089828646
James R. Barnard		P.O. Box 18	Whitefield	ME	04353	70141200000089826550
Jamie T. & Patricia A. Ellis		P.O. Box 134	Rangeley	ME	04970	701418200000089564795
Jana L. Viles		P.O. Box 474	North Anson	ME	04958	701418200000089564542
Jane A. Russo		217 Devine Road	Whitefield	ME	04353	70141200000089826338
Jane Raymond		50 Packard Road, PO Boc 133	Greene	ME	04236	70141200000089809683
Jane Washburn		222 River Road	Madison	ME	04950	70141200000089808181
Janet B. Hoffman		1274 West Alna Road	Alna	ME	04535	70141200000089808952
Janice M. and Merrill O. Fogg Jr.		337 US Route 1	Freeport	ME	04032	70141200000089805715
Janine Begin		41 Begin Lane PO Box 126	Greene	ME	04236	70141200000089809584
Jared R. Garceau		11 Cheney Drive	Wiscasset	ME	04578	70141200000089805708
Jason & Jody Brown		13 Garfield Street	Madison	ME	04950	70141200000089808358
Jason D. and Michelle A. Burgess		29 Philbrick Lane	Whitefield	ME	04353	70141200000089826420
Jason D. Hodgdon		718 West Shore Road	Westport Island	ME	04578	70141200000089805692
Jason Irish		256 Strickland Loop Road	Livermore Falls	ME	04254	70141200000089829780
Jason Stodder		3 Heritage Lane	Wiscasset	ME	04578	70141200000089826543
Jay and Carrie Pratt		2530 Kennebec River Road	Concord Twp.	ME	04920	70141200000089807764
Jay R. Berube		43 Gardiner Road	Whitefield	ME	04353	70141200000089826321
Jay Town Office	c/o Ronda Palmer, Town Clerk	340 Main Street	Jay	ME	04239	70141200000089806910
Jean and Susan Castonguay		340 Fayette Road	Livermore Falls	ME	04254	701418200000089563064
Jean C. Clark		158 Griffin Road	Windsor	ME	04363	70141200000089806170
Jean E. B. and David P. Flynn		342 Old Bath Road	Wiscasset	ME	04578	70141200000089805685
Jean Kelleher		15 Edgefield Lane	Brunswick	ME	04011	70141200000089808822
Jeanne L. Simpson		272 Morrison Hill Road	Farmington	ME	04938	701418200000089564955
Jeannine Monier Estate	c/o Gary Lajoie	2 North Mountain Road	Greene	ME	04236	7017100000074673953
Jeffery A. Lloyd &	Linda L. Henderson, Et UX	PO Box 421	Anson	ME	04911	70141200000089808273

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Jeffrey & Anita McFarlane		220 West Mills Road	Industry	ME	04938	70141200000089827434
Jeffrey & Cindie Averill		531 West Alna Road	Alna	ME	04535	70141200000089808747
Jeffrey & Robin LaPointe		418 High Street	North Berwick	ME	03906	70141200000089829070
Jeffrey and Craig McNear & Jeffrey and Donna Archer	Timothy Lee	368 Turkey Lane	Livermore Falls	ME	04253	70141820000089564108
Jeffrey and Mary Charest		46 Twin Oaks Drive	Brockton	MA	02302	70141200000089807634
Jeffrey and Vicki Adams		246 Ferry Road	Lewiston	ME	04240	70141820000089563460
Jeffrey Brunelle		56 Pond Road	Wilton	ME	04294	70141200000089827137
Jeffrey Greb & Jeffrey R. Hanlon	Christine Hoffman	36 Green Road, P.O. Box 36	North Brookfield	MA	01535	70141820000089564801
Jeffrey T. McCormick & Jeffrey Thurlow	Bobbi-Lynn Knowlton	5801 Alpine Woods Drive	Anchorage	AK	99516	70141820000089562791
Jennifer & Dean Ouellette		2 Caron Street	Lisbon	ME	04935	70141200000089827427
Jennifer and Jeremy Ames		10 Misty Mountain Lane	Whitefield	ME	04353	70141200000089826413
Jennifer Barker		960 Allen Pond Road	Greene	ME	04236	70141200000089809676
Jennifer Oakes		698 East Jay Road	Jay	ME	04239	70141200000089829803
Jennifer Zweig-Hebert		PO Box 244	Cumberland	ME	04021	70141200000089827793
Jereme P. Winkley		1841 Lisbon Street	Lewiston	ME	04240	70141200000089809478
Jeremy B. and Lisa M. Arsenault		1515 Busbee Road (Lot32)	Gaston	SC	09053	70141200000089808174
Jerome Gamache & Jesse Richards & Jessica Benedict	Sara Tremblay Laura Elliott	31 Mount Hunger Road	Starks	ME	04911	70141820000089564559
Jessica J. Norton		2 Mohegan Street	Winslow	ME	04901	70141200000089827410
JFM No. 2 CORP.		32 Heald Drive	Durham	ME	04222	70141820000089561831
Jillian and Joshua Lovejoy		32 Powell Road	Cumberland	ME	04021	70141200000089810115
Jimmy Mathieu		520 Weeks Mills Road	Farmington	ME	04938	70141820000089564863
Jo Rumley & Joan D. and John Soper, et. Al.	Carlene Wilbur	350 Old Greene Road	Lewiston	ME	04240	70141200000089809379
Joan E. Sutter		142 Griffin Road	Windsor	ME	04363	70141200000089806163
Joan Gray		800 Center Street	Auburn	ME	04210	70141820000089563453
Jo-Ann A. Morin		3 Berwick Street	South Portland	ME	04106	70141200000089826925
Jodi Bragdon & Jody Beliveau	James Niemi	101 Donigan Road	Moscow	ME	04920	70141200000089829063
Joe Cloutier		73 Shaw Hill Road	Industry	ME	04938	70171000000074673892
John & Barbara Chandler		364 Willow Lane	Wiscasset	ME	04578	70141200000089805678
John A. and Elisha Soper		170 Dickinson Road	Wiscasset	ME	04578	70141200000089805661
John A. and Pamela B. Lizotte		4 South Lisbon Road	Lewiston	ME	04240	70141200000089809461
John and Annie Jeanmonod		130 Horn Hill Road	Fairfield	ME	04937	70141820000089564948
John and Catherine Purington		156 Fickett Road	Pownal	ME	04069	70141200000089827786
John and Jean Gatchell		1020 Church Hill Road	Leeds	ME	04263	70141820000089563996
John and Louise Beaulieu		365 Patten Road	Greene	ME	04236	70141200000089809577
John and Mary Newman		93 Tuttle Road	Cumberland	ME	04021	70141200000089810061
John Atwood		PO BOX 692	Norridgewock	ME	04957	70141200000089827021
John Dube		364 Willow Lane	Wiscasset	ME	04578	70141200000089805654
John H. and Kevin Brooks Lickteig		744 Stackpole Road	Durham	ME	04222	70141820000089561893
John Hogan		1342 Still River Drive	Venice	FL	34293	70141820000089561473
John J. & Brenda L. Crompton		129 Cooper Road	Whitefield	ME	04353	70141200000089826536
John J. Pagurko III		106 Soules Hill Road	Jay	ME	04239	70171000000074674073
John Mason		West 9395 Lucas Drive	Iron Mountain	MI	49801	70141820000089563156
John Maxwell		70 Fish Street	Leeds	ME	04263	70141820000089563897
John Ostromecky		39 Clark Road	Albion	ME	04910	70141200000089807566
John Rabuffo		500 Evergreen Street North East	Palm Bay	FL	32907	70141200000089821403
John Swisher		25 Wall Street	Woodmont	CT	06460	70141820000089564566
John W. Cody Revocable Trust	c/o John Cody, Trustee	PO Box 371	Bingham	ME	04920	70141200000089807627
John W. Parsons		11 Douglas Circle	Greenville	RI	02828	70141200000089808365
Johnathan W. Morris		571 Townhouse Road	Whitefield	ME	04353	70141200000089826314
Johnna Edith and Lester Edwin Sheaffer, Jr.		213 Strickland Loop Road	Livermore Falls	ME	04254	70141200000089829797
Jon T. & Jean M. Oplinger		PO Box 62	Leeds	ME	04263	70141820000089564085
Jonathan and April Zagardney		1184 Albion Road	Winslow	ME	04901	70141820000089564962
Jonathan and Roberta Burr		42 Donald Tennant Circle	North Attleboro	MA	02760-4731	70141200000089829056
Jonathan Dingley		454 Mile Hill Road	New Sharon	ME	04955	70141200000089827397
Jonathan Sferazo		250 Southbury Road	Roxbury	CT	06783	70141200000089807658
Jordan Fortin		420 McCrillis Corner Road	Wilton	Maine	04294	70141200000089806415
Josef Hnulik		28 Durham Road	Pownal	ME	04069	70141820000089561817
Joseph & Linda Pereira		71 Pine Crest Lane	Whitefield	ME	04353	70141200000089826437
Joseph & Rejeanne Plante		142 Davis Road	Farmington	ME	04938	70141820000089564900
Joseph and Lynn Derocher		715 Mountain Road	Woolwich	ME	04579	70141200000089805326
Joseph and Pauline Nota		254 Middle Road	Cumberland	ME	04021	70141200000089810092
Joseph C. and Julie K. Bernard		PO Box 25	Farmington	ME	04938	70141820000089563392
Joseph D. Whitmore		635 Old Country Road	Huntington Station	NY	11746	70141200000089807559
Joseph Elie		43 Parkwoods Drive	Anson	ME	04911	70141200000089808266
Joseph Gozdek Jr.		41 Paradise Lane	Dedham	MA	02026	70141200000089808938
Joseph McKinnon		22 Anthony Street	Berkley	MA	02779	70141200000089827380
Joseph R. and Elizabeth Heath		PO Box 31	Bingham	ME	04920	70141200000089829049
Josh and Zoe Thomas		38 Addition Road	Greene	ME	04236	70171000000074673915
Joshua and Tracy Farmer		17 Riley Street	Lewiston	ME	04240	70141200000089809362
Joshua C. Hayward &	Nichole L. Mullens	57 Granite Farm Hill Road	Durham	ME	04222	70141820000089561824
		516 River Road	Lebanon	ME	04027	70141200000089826529
		161 Old Webster Road	Lewiston	ME	04240	70141820000089563446
		5289 Spoonhill Road	North Port	FL	34291	70141200000089807740
		60 Merrill Road	Lewiston	ME	04240	70141200000089809454
		17 Village View Lane	Whitefield	ME	04353	70141200000089826307
		10 Misty Mountain Lane	Whitefield	ME	04353	70141200000089826444
		18 Bluff Road	Concord Twp.	ME	04920	70141200000089807641
		88 Bog Road	Augusta	ME	04330	70141200000089806156

Owner (1st Owner, Full Name)	Owner 2 (2nd+ Owner(s), Full Name)	Mailing Address	Mailing Town	Mailing State	Mailing ZIP	Tracking Number (Used After Mailing is sent)
Joshua D. and Stephanie L. McConnell		578 US Route 1	Stocking Springs	ME	04981	70141200000089806149
Joshua E and Donna M. Parker		271 Griffin Road	Windsor	ME	04363	70141200000089806132
Joshua J. And Tiffany M. Demers		18 Griffin Road	Windsor	ME	04363	70141200000089806125
Joshua Laliberte		34 Brown Street	Lewiston	ME	04240	70141200000089809355
Joshua M. Boudreau &	Mary E. Spieldenner	724 Vigue Road	Windsor	ME	04363	70141200000089806118
Jubal Alexander Gilbert &	John J. Romano	10 Line Drive	Wiscasset	ME	04578	70141200000089805647
Judith A. Smith		P.O. Box 493	Hampden	ME	04444	70141820000089563057
Judy E. Cochran		265 Strickland Loop Road	Livermore Falls	ME	04254	70141200000089829780
Judy Letourneau		1651 Main Street	Lewiston	ME	04240	70141820000089563439
Jug Hill Riders	c/o John Davis	P.O. Box 237	East Livermore	ME	04228	70141200000089829773
June Marie Malcom		2 O'Farrell Street	Topsham	ME	04086	70141200000089807108
Karen Atwood		2639 New Haven Street	Concord	NC	28027	70141820000089561480
Karen L. and Kevin Cassidy		31 Merrill Lane	Durham	ME	04222	70141820000089561886
Karen Parent		23 Parent Lane	Greene	ME	04236	70141200000089809669
Karen, Joshua, and Matthe Donahue		15 Winchester Street, Apt 1	Fairfield	ME	04920	70141200000089807580
Kasey Fish &	Jesse Lupo	1095 Lakings Road	Etna	ME	04434	70141200000089828776
Kathryn A. Lightbody		PO Box 54	N. Anson	ME	04958	70141200000089808167
Kathryn E. Childs &	Diane E. Doughty	206 Maxcys Mills Road	Windsor	ME	04363	70141200000089806101
Kathy M. & Andrew J. Giroux		32 Horseback Road	Anson	ME	04911	70141200000089808372
Keith and Christina Burns		53 Center Street	Nobleboro	ME	04555	70141200000089828769
Keith Casey		191 Legion Park Road	Windsor	ME	04363	70141200000089826095
Keith Higgins		734 Stackpole Road	Durham	ME	04222	70141820000089562241
Kenneth & Kathleen S. Brennan		23 Borque Street	Somersworth	NH	03878	70141820000089564573
Kenneth and Cheryl Soucier		PO Box 286	Bingham	ME	04920	70141200000089807733
Kenneth and Donna Perry		789 Park Street	Livermore Falls	ME	04254	70141200000089829766
Kenneth and Hilary Holm		118 Philbrick Lane	Whitefield	ME	04353	70141200000089826512
Kenneth and Rosemary Merrill		36 Linda Drive	Greene	ME	04236	70141200000089809560
Kenneth and Sheila Lyman		14 Lyman Lane	Livermore Falls	ME	04254	70141200000089829759
Kenneth J. Good		507 Summit Drive	Orange	CT	06477	70141820000089564924
Kerry D. and Jennifer Zweig Herbert		31 Mount Hunger Road	Starks	ME	04911	70141200000089827373
Kevin A. Dunton		23 Bear Brook Road	Livermore Falls	ME	04254	70141200000089829544
Kevin and Norman Lauze		14 Cove Side Drive	Harpeswell	ME	04079	70141200000089809447
Kevin and Robin Healy		137 Copper Ridge Road	Greene	ME	04236	70171000000074673939
Kevin Leclair		796 West Alna Road	Alna	ME	04535	70141200000089808839
Kim Kallman	c/o Karen Royal	36 Charlotte's Road	Brownville	ME	04414	70141200000089827120
Kirby S. Hight		PO Box 387	Skowhegan	ME	04976	70141820000089561497
Kirk and Melissa Heald		39 Heald Drive	Durham	ME	04222	70141820000089562234
Konrad and Michele Bailey		639 Bailey Hill Road	Farmington	ME	04938	70141820000089564489
Kristine Lassiter		24 West View Drive	Lewiston	ME	04240	70141200000089809515
L H Housing LLC		1712 Topaz Drive	Loveland	CO	80537	70141200000089809652
LA Quarry LLC		PO Box 9340	Auburn	ME	04210	70141820000089563422
Landmark Investments LLC		259 Minot Avenue	Auburn	ME	04240	70141200000089809430
Lanza Family 2012 Trust	c/o Anthony Lanza	44 Westmister Road	Fitzwilliam	NH	03447	70141200000089826918
Larry & Sharon A. Livingston		37 Forest Lane	Hollis	ME	04042	70141200000089808259
Larry and Tami Labul		PO Box 444	Farmington	ME	04938	70141820000089564870
Larry Klickstein		3951 1/2 Sawtelle Boulevard	Los Angeles	CA	90066	70141200000089807634
Larry Rines		P.O. Box 446	Wiscasset	ME	04578	70141200000089808730
Laurie Manzer		PO Box 188	Anson	ME	04911	70141820000089564580
Lawrence and Betty Jo Roix		46 Parkview Avenue	Livermore Falls	ME	04524	70141200000089829537
Lawrence and Francine Baker		7 Messer Road	Moscow	ME	04920	70141200000089829018
Lawrence Beatrice Jr.		PO Box 240	Bingham	ME	04920	70141200000089807535
Lawrence F. Record, Jr.		643 Augusta-Rockland Road	Windsor	ME	04363	70141200000089806088
Lee and Jennifer Richards		137 Devine Road	Whitefield	ME	04353	70141200000089826321
Leeds Town Office	c/o Joyce Pratt, Town Clerk	8 Community Drive	Leeds	ME	04263	70141200000089806910
Leisa C. Hilton		56 Lloyd Road	Anson	ME	04911	70141200000089808143
Leo Hill		PO Box 291	Bingham	ME	04920	70141200000089829032
Leonard, Marie, and Laurier Masse		117 Harlow Hill Road	Turner	ME	04282	70141820000089563989
Leroy and Deanna Tillson		889 Embden Pond Road	Embsden	ME	04958	70141200000089829025
Leroy D. Lane		71 Horn Hill Road	Fairfield	ME	04937	70141200000089827366
Leslie and Benjamin Geissinger		70 Turnel Road	Jay	ME	04239	70171000000074674066
Leslie and Marie Greenleaf		PO Box 477	Anson	ME	04911	70141200000089808341
Leslie Tainter		745 Park Street	Livermore Falls	ME	04254	70141200000089829520
Leta Mae and Edward Howes		21 Summer Street	Skowhegan	ME	04976	70141200000089807726
Levi Daku		179 Weld Road	Wilton	ME	04294	70141820000089561671
Levon Travis		12 Cheney Drive	Wiscasset	ME	04578	70141200000089805630
Lewiston City Hall	c/o Kathleen M. Montejo, City Clerk	27 Pine Street	Lewiston	ME	04240	70141200000089806903
Liline and Gary Elie		838 College Street	Lewiston	ME	04240	70141200000089809331
Lillian G. Colby		P.O. Box 125	Wiscasset	ME	04578	70141200000089805623
Lincoln County		P.O. Box 249	Wiscasset	ME	04578	70141200000089805616
Linda Dean, ET AL	c/o Arlene Jones (Life Estate)	40 Turnel Road	Livermore Falls	ME	04254	70141820000089563149
Linda L. Poissonnier		126 Preble Avenue	Anson	ME	04911	70141200000089808242
Linda Lank		41 Fourth Street	Bristol	CT	06010	70141200000089808921
Linda Theberge		60 Larrabee Road	Lewiston	ME	04240	70141820000089563415
Linden C. and Peggy L. Simmons		P.O. Box 713	Wiscasset	ME	04578	70141200000089805609
Linton and Diane Robinson		652 Borough Road	Chesterville	ME	04938	70141820000089563040
Linwood York		560 Farmington Falls Road	Farmington	ME	04938	70141820000089564856
Lisa B Thomas Trust 11-19-02	c/o Lisa Thomas, Trustee	1171 Green Valley Road	Napa	CA	94558	70141200000089807627
Lisa Comito		1098 West Alna Road	Alna	ME	04535	70141200000089808846

Owner (1st Owner, Full Name)	Owner 2 (2nd+ Owner(s), Full Name)	Mailing Address	Mailing Town	Mailing State	Mailing ZIP	Tracking Number (Used After Mailing is sent)
Lisa M. Barnes		572 Gardiner Road	Wiscasset	ME	04578	70141200000089805593
Lisa M. Hay &	Christine K. Carter	906 Recreation Drive	Corpus Christi	TX	78418	70141200000089826451
Livermore Falls Town Office	c/o Amanda Allen, Town Clerk	2 Main Street	Livermore Falls	ME	04254	70141200000089806897
Longchamps & Sons, Inc.	Longchamps Realty LLC	15 Lisbon Street	Lisbon	ME	04250	70141200000089827236
Lonna Bowie		130 Bowen Road	Durham	ME	04222	70141820000089562227
Lorraine and Wayne Steward		PO Box 412	Bingham	ME	04920	70141200000089807528
Lorraine M. Preble (Life Estate)	c/o Daniel R. Moody & Lisa Szczepaniak	76 Hilltop Road	Anson	ME	04911	70141200000089808150
Lou Anne Story		113 Doyle Road	Whitefield	ME	04353	70141200000089826505
Louis and Lynda Canizzo		371 Birch Hollow Drive	Long Island	NY	11967	70141200000089829001
Louis and Roberta Perron		183 Merrill Road	Lewiston	ME	04240	70141200000089809423
Louis Hight		P.O. Box 387	Skowhegan	ME	04976	70141820000089564917
Louise Sanders	c/o George Richardson	PO Box 3400	Auburn	ME	04210	70141820000089563880
Lowell S. and Karen L. Piper		40 Piper Road	Embsden	ME	04958	70141820000089561503
Lucas Sirois		PO Box 166	Farmington	ME	04938	70141820000089564887
Lucien and Doris Doucet		5 Acorn Lane	Lewiston	ME	04240	70141200000089809324
Luke Delano		19 Finn Brook Lane	Whitefield	ME	04353	70141200000089826284
LUPC Moosehead Region - RE: Towns Abutting the NECEC Corridor	c/o Debra Kaczowski	43 Lakeview Street - PO Box 1107	Greenville	ME	04441-1107	70141200000089806880
LUPC Western Region - RE: Towns Abutting the NECEC Corridor	c/o Brookelyn Gingras	932 US Route 2 East	Wilton	ME	04294	70141200000089806873
M & B LLC.		504 Pond Road	Lewiston	ME	04240	70141200000089809317
Mack Beaulieu		1225 Sabattus Street	Lewiston	ME	04240	70141200000089809089
Madeleine Roy		208 Old Lisbon Road	Lewiston	ME	04240	70141200000089809218
Madison Electric Works		6 Business Park Drive	Madison	ME	04950	70141200000089827342
Main Line Fence Company		268 Middle Road PO Box 27A	Cumberland Center	ME	04021	70141200000089810153
Maine Central Railroad		16 State House Station	Augusta	ME	04333	70141200000089805586
Maine Central RailRoad Co	c/o Guilford Tran Ind Inc. Real Estate Dept - Carl Plourde	Iron Horse Park	North Billerica	MA	01862-1676	70141200000089808334
Maine Dept. of Conservation	Bureau of Parks and Lands	22 SHS	Augusta	ME	04333	7017100000074673991
Maine Yankee Atomic Energy		321 Old Ferry Road	Wiscasset	ME	04578	70141200000089805579
Malcolm and Marilyn Turner (Trustees)		291 Soules Hill Road	Jay	ME	04239	7017100000074674059
Malcom A. and Barbara A. French		122 Abbott Drive	Enfield	ME	04493	70141200000089828639
Marc and Catherine Casavant		350 Webber Avenue	Lewiston	ME	04240	70141200000089809553
Marc and Pamela Bailey		602 Bailey Hill Road	Farmington	ME	04938	70141820000089561688
Marc and Theresa Cyr		47 Cross Road	Sabattus	ME	04280	70141200000089809317
Marc Doyon		16 Stone House Court	Whitefield	ME	04353	70141200000089826468
Marc V. and Susan M. Menard		796 Stackpole Road	Durham	ME	04222	70141820000089562272
Marcel and Wendy Obie		211 Old Lisbon Road	Lewiston	ME	04240	70141200000089809102
Marcus A. Baldwin		P.O. Box 755	Biddeford	ME	04005	70141820000089562258
Margaret L. Hodgdon		495 Birch Point Road	Wiscasset	ME	04578	70141200000089805562
Margery & Michael Thompson		57 Newfield Road	Shapleigh	ME	04076	70141200000089827014
Marguerite and Edward Howes		PO Box 194	Bingham	ME	04920	70141820000089562289
Marguerite Grant et. Al.		283 Fish Street	Leeds	ME	04263	70141820000089564078
Mark & Cynthia Rego		55 Lothrop Road	Alna	ME	04535	70141200000089808723
Mark & Lisa Ronco		420 NW Poplar	Lees Summit	MO	64064	70141200000089827113
Mark Ancker		1669 Industry Road	Industry	ME	04938	70141820000089563361
Mark and Contessa Garcelon		229 Belanger Road	Jay	ME	04239	70141820000089563132
Mark and Kathleen Johnson		PO Box 163, Gray Road	Boothbay	ME	04537	70141200000089826901
Mark and Lucille Slocum		839 Stackpole Road	Durham	ME	04222	70141200000089828752
Mark Deroche		347 Skowhegan Road	Fairfield	ME	04937	70141820000089562012
Mark Hager		20 Surrey Lane	Hampden	ME	04444	70141200000089808716
Mark Labonte		465 College Street	Lewiston	ME	04240	70141200000089809201
Mark Page		7 North Road	Leeds	ME	04263	70141820000089563972
Mark Rodrigue		65 Googin Street	Lewiston	ME	04240	70141200000089809294
Mark Timko		451 Erico Avenue	Elizabeth	NJ	07202	70141200000089826499
Mark, Tina and George Binette		426 Pond Road	Lewiston	ME	04240	70141200000089809096
Marlene and Andy Witham		102 North Line Road	Greene	ME	04236	7017100000074673922
Martha J. Manchester		77 Mill Road	Edgecomb	ME	04556	70141200000089826376
Martina Eastman		71 Turnel Road	Jay	ME	04239	70141820000089563033
Martina L. Marschall		26 Harold Avery Road	Ashland	NH	03217	70141200000089827328
Mary Ann Glebocki		1146 Sabattus Street	Lewiston	ME	04240	70141200000089809195
Mary Anne Rice		185 Oak Street	Bath	ME	04530	70141820000089564597
Mary H. & Francis L. Shorey		113 Hilton Hill Road	Anson	ME	04911	70141200000089808235
Maryann Ford		143 Fayette Road	Livermore Falls	ME	04254	70141200000089829513
Mathew and Dennis Bailey		PO Box 1	West Farmington	ME	04992	70141200000089807504
Mathew Ferland		39 Therrien Road	Jay	ME	04239	70141200000089829506
Matt L. Veilleux	Sarah M. Trafford	179 Strickland Loop Road	Livermore Falls	ME	04254	70141200000089829490
Matthew A. True		39 Parker Woods Drive	Arundel	ME	04046	7017100000074674042
Matthew Higgins		45 Todd Road	Greene	ME	04236	70141200000089809645
Matthew R. Walsh		22 Pond View Road	Greene	ME	04236	70141200000089809546
Matthew W. and Linda R. Tiffany		401 Auburn Pownal Road	Durham	ME	04222	70141820000089562210
Maurice L. Beaulle		103 Knapp Road	Leeds	ME	04263	70141820000089563873
Megan F. Huber		12 Bowen Road	Durham	ME	04222	70141820000089562333
Melinda Worthley		176 Middle Street	Farmington	ME	04938	70141200000089827335
Melissa Herrick		PO Box 123	West Forks	ME	04985	70141200000089827007
Melva G. and Kevin J. James	c/o Kevin James	60 Shea Road	Wiscasset	ME	04578	70141200000089805555
Meredith M. and Kevin F. Black		774 Stackpole Road	Durham	ME	04222	70141820000089562265
Merle L. Lloyd & Sons, Inc.		PO Box 421	Anson	ME	04911	70141200000089808129
Merrill Properties, LLC		P.O. Box 120	Jay	ME	04239	70141820000089563125
Merron Historic Properties, LLC	C/O Nancy A. Merron	PO Box 3	Wilton	Maine	04294	70141200000089806408
Merwin Alexander Delano III		42 Dodge Street	Rochester	NH	03867	70141200000089805548

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Michael & Amy Preston		P.O. Box 47	Alna	ME	04535	7014120000008980617
Michael & Colette Bouchard		8 Pare Street	Waterville	ME	04901	70141200000089827359
Michael A. Pontau, Sr.		605 Gardiner Road	Wiscasset	ME	04578	70141200000089805531
Michael and Beverly Parent		156 Old Webster Road	Lewiston	ME	04240	70141200000089809287
Michael and Cheryl Minicucci, Trustees		81 Bailey Road	Industry	ME	04938	70141820000089563255
Michael and Daniel Hebert		9 Gould Road	Lewiston	ME	04240	70141200000089809089
Michael and Jennifer Edes		8 Edes Road	Cumberland	ME	04021	70141200000089810054
Michael and Jo-Anne Lapointe		16 Packard Road	Greene	ME	04236	70171000000074673915
Michael and Kelly Blue		18 Corvella Street	Leeds	ME	04263	70141820000089564061
Michael and Lillian Fazekas		881 Church Hill Road	Leeds	ME	04263	70141820000089563965
Michael and Monique Laberge		242 Ferry Road	Lewiston	ME	04240	70141200000089809188
Michael and Rachel Meegan		2 Shufelt Road	Walpole	MA	02071	70141820000089562951
Michael and Susan Richard		1085 Main Road	Milford	ME	04461	70141200000089828745
Michael Clark		300 Stream Road	Moscow	ME	04920	70141200000089828981
Michael E. Witham		250 Kennebec River Road	Embsden	ME	04958	70141820000089564603
Michael Foley & Lisa Rideout	c/o Puvit Singh & Ritka Kaile	276 Foreside Road	Cumberland Foreside	ME	04110	70141200000089810016
Michael G. Tsmacher		47 Fahi Pond Road	N. Anson	ME	04958	70141200000089808327
Michael J. & Pamela M. Mitchell		263 Coopers Mills Road	Windsor	ME	04363	70141200000089806071
Michael J. Storey		224 Middle Road	Cumberland	ME	04021	70141200000089810023
Michael K. and Melissa S. Libby		74 Heald Drive	Durham	ME	04222	70141820000089562203
Michael P. Pond &	Stephen J. Emery	89 Barre Road	Hubbardston	MA	01452	70141820000089561510
Michael V. & Katherine N. Moffett		194 Davis Road	Farmington	ME	04938	70141200000089809911
Michael Velucci		6 Mulberry Lane	Litchfield	NH	03052	70141200000089828998
Michael Zoella Jr.		109 Prides Crossing Road	Sudbury	MA	01776	70141820000089561985
Michael, Carol, and Eric Baker		899 New Vineyard Road	New Vineyard	ME	04956	70141820000089563378
Michael, Jason, & Matthew Renaud		155 Franklin Street	Winooski	VT	05404	70141200000089807504
Michelle Mason &	Kevin Woodbury Jr.	147 Route 202	Greene	ME	04236	70141200000089809638
Michelle Morris		37 North Line Road	Leeds	ME	04263	70141820000089563866
Michelle R. Edwards		2297 Riverside Drive	Auburn	ME	04210	70141200000089807955
Mildred L. Langevin Living Trust		34 Langevin Road	Chesterville	ME	04938	70141200000089807818
Minerva M. Norris		60 Norris Drive	Leeds	ME	04263	70141200000089829478
Mjac Langley		411 Pond Road	Lewiston	ME	04240	70141200000089809270
Moira and Sean Teekema		243 Coopers Mills Road	Windsor	ME	04363	70141200000089806064
Monica L. Frith		262 Embsden Pond Road	North Anson	ME	04958	70141200000089827298
Monty & Mary Jones		135 South Clary Road	Jefferson	ME	04348	70141200000089808518
Moscow Town Office	c/o Lise Smith, Town Clerk	110 Canada Road	Moscow	ME	04920	70141200000089806866
Nancy Gordon		PO Box 594	Amherst	MA	01004	70141200000089808228
Nancy Gross &	Fernald Smith	412 West Old Town Road	Old Town	ME	04468	70141200000089827106
Nancy Ripley Heirs	c/o Iva M. Ripley, Personal Representative	371 Townhouse Road	Whitefield	ME	04353	70141200000089826475
Nathan Richards		3840 West L.K. Samm Parkway N.E., APT 102	Redmond	WA	98052	70141200000089829483
Nature Conservancy	Fort Andross Box 22	14 Maine Street - Suite 401	Brunswick	ME	04011	70141200000089827182
ND Paper, Inc.	c/o Finance Department, Attn: Kelly Berry	35 Hartford Street	Rumford	ME	04276	70141200000089808136
Neil Patrick &	Marion Bourgoin	1765 Main Street	Greene	ME	04236	70141200000089809539
Nelson N. Harris		P.O. Box 504	Anson	Me	04911	70141200000089827304
Neubis Properties Inc.		74 Island View Drive	Greene	ME	04236	70141820000089562906
New Gloucester Town Office	c/o Brenda Fox Howard, Town Clerk	385 Intervale Road	New Gloucester	ME	04260	70141200000089806859
New Norland Grange	c/o Frances Berry	5 Center Road	Livermore	ME	04253	70141200000089829452
New Sharon Town Office	c/o Pamela Griswold, Town Clerk	11 School Lane	New Sharon	ME	04955	70141200000089806842
Newman and Deborah Blanchard		2 Mountain View Drive	Leeds	ME	04263	70141820000089564054
Newton Family Real Estate Trust	c/o David R. Newton, Trustee	40 High Street, Apartment #1	Andover	MA	01810	70141200000089826482
Nicholas J. Rehagen &	Cindy J. Langewisch	49 Androscoggin Bluffs	Livermore Falls	ME	04254	70141200000089829469
Nicholas R. Grover		29 Rocky Ridge Drive	Wiscasset	ME	04578	70141200000089805524
Nicole M. Jones &	Scott R. Osgood	139 Bowen Road	Durham	ME	04222	70141820000089562173
Noel C. and Peter J. Zeeb		32 Soden Street	Cambridge	MA	02139	70141200000089806828
Noel C. and Peter J. Zeeb		36 Longfellow Avenue	Brunswick	ME	04011	70141200000089806811
Norman & Patricia Dickey		PO Box 1	Skowhegan	ME	04976	70141200000089826895
Norman and Felicia Bernier		33 Rose Road, PO Box 354	Greene	ME	04236	70141200000089809621
Norman F. & Beth B. Luce		P.O. Box 22	Anson	ME	04911	70141200000089827311
Norman L. and Christie J. Scribner		17 Royalsborough Road	Durham	ME	04222	70141200000089807856
Norman P. Sherman		47 Fox Run Road	Westport Island	ME	04578	70141200000089805517
Normand and Elizabeth Turgeon		198 Ferry Road	Lewiston	ME	04240	70141200000089809072
Norris A. Smith		65 East Jay Road	Jay	ME	04239	70141820000089563026
Norris C. and Victoria A. Bowie		403 Coopers Mills Road	Windsor	ME	04363	70141200000089806057
Oak Hill Homestead, LLC	c/o Matthew Northrup	266 Townhouse Road	Whitefield	ME	04353	70141200000089806804
Osborn M. Delano Heirs		19 Finn Brook Lane	Whitefield	ME	04353	70141200000089806798
Owen and Doris Viles		566 Stream Road	Moscow	ME	04920	70141200000089828974
Owen Haskell		510 Durham Road	New Gloucester	ME	04260	70141820000089562326
Owen Keene		1667 Main Street	Lewiston	ME	04240	70141200000089809171
Oxford Property Management	c/o David or Deborah Andrews	P.O. Box 151	South Paris	ME	04281	70141200000089806040
Partick Gorham		290 Route 202	Greene	ME	04236	70141200000089809522
Passamaquoddy Indian Reservation	Passamaquoddy Wild Blueberry Company	PO BOX 93	Columbia Falls	ME	04623	70141200000089829247
Patricia and Kenneth Spear		36 Mcarter Point Road	Cushing	ME	04563	70141200000089826994
Patricia and Mark Christman		238 Merrill Hill Road	Greene	ME	04236	70141820000089562890
Patricia and Vincent J. Santoni, Jr.		1294 Kennebec River Road	Embsden	ME	04958	70141820000089564498
Patricia Parks		P.O. Box 83	Whitefield	ME	04353	70141200000089806781
Patricia Van Horne		7 Joyce Street	Skowhegan	ME	04976	70141820000089562296
Patrick & Stacey Linehan		22 West Pleasant Street	Oakland	ME	04963	70141200000089827090
Patrick A. Thayer &	Saramae Edgerly	12 Petticoat Acres Lane	Whitefield	ME	04353	70141200000089806774

Owner (1st Owner, Full Name)	Owner 2 (2nd+ Owner(s), Full Name)	Mailing Address	Mailing Town	Mailing State	Mailing ZIP	Tracking Number (Used After Mailing is sent)
Patrick and Robin Chase		P.O. Box 142	Whitefield	ME	04353	70141200000089806767
Patrick Callahan		143 Horton Street	Lewiston	ME	04240	70141200000089809263
Patrick Fitzmaurice		317 Beedle Road	Richmond	ME	04357	70141200000089826888
Patrick J. Daigle		168 Old Point Avenue	Madison	ME	04950	70141200000089808112
Patrick Quigg		443 Auburn Pownal Road	Durham	ME	04222	70141820000089562197
Patty Keay		71 Dunham Road	Vassalboro	ME	04989	70141200000089826987
Paul & Mary Matheson		PO Box 461	Bingham	ME	04920	70141200000089828967
Paul and Nancy Matteson		243 Fickett Road	Pownal	ME	04069	70141200000089827779
Paul Bernier		33 Bernier Lane	Winthrop	ME	04364	70141200000089806033
Paul Fischer		120 Sleeper Road	Greene	ME	04236	70141820000089562883
Paul J. III & Cheryl M. Daigle		221 Main Street	Anson	ME	04911	70141200000089808013
Paul L. and Alice Leask		122 Doyle Road	Whitefield	ME	04353	70141200000089806750
Paul L. Chretien &	Dale R. Farrar	801 Park Street	Livermore Falls	ME	04254	70141200000089829438
Paul W. and Linda L. Bowie		22 Cloutier Road	Durham	ME	04222	70141820000089562128
Percy Hutchins		1223 Sabattus Street	Lewiston	ME	04240	70141200000089809065
Percy Perkins Heirs		283 Moose Hill Road	Livermore Falls	ME	04254	70171000000074674035
Peter A. and Theresa Morin		42 Branch Lane	Whitefield	ME	04353	70141200000089806743
Peter and Karen Mercier		4 VA Dean School Road	Leeds	ME	04263	70141820000089563958
Peter and Melodie Coyman		132 Central Street	Farmington	NH	03835	70141200000089828738
Peter and Thalia Burr		244 Middle Road	Cumberland Center	ME	04021	70141000000089810030
Peter H. and Teresa J. Fogg		33 Two Bridge Road	Wiscasset	ME	04578	70141200000089805494
Peter H. Burr Jr		15 Greeley Road	Cumberland Center	ME	04021	70141200000089810047
Peter Hunt &	Kimberly Hourihan-Hunt	51 Greeley Road	Cumberland	ME	04021	70141200000089810122
Peter Tischbein		36 Colpitt Road	Alna	ME	04535	70141200000089808709
Peter Tracy		469 Whittier Road	Farmington	ME	04938	70141200000089828622
Peter Urbanski &	Nancy Mason	916 East Jay Road	Jay	ME	04239	70141820000089563118
Philip and Audrey M. Latella		28 Mountain Road	Wiscasset	ME	04578	70141200000089805494
Philip and Heidi Woody		PO Box 852	Hope Valley	RI	02832	70141200000089828950
Philip Latella, Jr.		336 Bradford Road	Wiscasset	ME	04578	70141200000089805487
Phillip & Bonnie Mattingly		PO Box 105	N. Anson	ME	04958	70141200000089807900
Plumcreek Timberlands LLC		PO Box 978	Farmington	ME	04938	70141200000089827212
Pownal Town Office	e/o Melissa Henes, Town Clerk	429 Hallowell Road	Pownal	ME	04069	70141200000089806835
Prescott Heirs	C/O Jennifer Fotter	9 Daigle Drive	Anson	ME	04911	70141200000089808105
Priscilla Davis		7 Stetson Street	Brunswick	ME	04011	70141200000089808600
Rachel Hine		545 Park Street	Livermore Falls	ME	04254	70141200000089829445
Rachel J. Jones		21 Twin Oaks Road	Wiscasset	ME	04578	70141200000089808501
Rachel Michaud		9 Addition Road	Greene	ME	04236	70141820000089562784
Ralph Norris		60 Norris Drive	Leeds	ME	04263	70141200000089829421
Randall K. and Angie M. Miller		24 Rivers Drive	Durham	ME	04222	70141820000089562319
Randall Pulisifer		15 Jody Lane	Forestdale	MA	02644	70141820000089563859
Randall Pulisifer		PO Box 1119	Forestdale	MA	02644	70141820000089564047
Randell and Sandra Millett		1626 Industry Road	Industry	ME	04938	70141820000089563279
Randy T. Huntley		66 Heald Drive	Durham	ME	04222	70141820000089562180
Randy Trefethen		107 Eastern Drive	Wales	ME	04280	70141200000089809157
Raoul and Marsha LaPlante		222 River Road	Livermore Falls	ME	04254	70141200000089829414
Ray M. & Linda Tingley		237 Fahi Pond Road	N. Anson	ME	04958	70141200000089808006
Raymond and Janet Leblond		1087 Maine Street	Lewiston	ME	04240	70141200000089809256
Raymond D. and Pamela J. Turgeon		89 Bowen Road	Durham	ME	04222	70141820000089562135
Raymond Rolfe		488 Northern Avenue	Farmingdale	ME	04344	70141200000089809058
Raymond S. Farnsworth		182 Sterry Hill Road	Starks	ME	04911	70141200000089827694
Rebecca Watson		PO Box 158	South Casco	ME	04077	70141820000089563941
Regina A. Davey		89 Shamrock Avenue	Damariscotta	ME	04543	70141200000089806736
Reginald A. Barnes		73 Androscoggin Bluffs	Livermore Falls	ME	04254	70141200000089829407
Reginald and Brenda Padham		1220 Kennebec River Road	Embsden	ME	04958	70141820000089564481
Reginald Lane		237 Chesterville Road	Jay	ME	04239	70141820000089563019
Renee Bernier		1220 Sabattus Street	Lewiston	ME	04240	70141200000089809164
Renee Demers-Johnson		952 Goose Pond Road	Shapleigh	ME	04076	70141820000089562975
Richard & Laurie Preble		857 Warren Hill Road	Palmyra	ME	04965	70141200000089827083
Richard & Veronica Baylis		256 Bailey Road	Industry	ME	04938	70141820000089563361
Richard and Colleen Condon		122 Davis Road	Farmington	ME	04938	70141200000089809812
Richard and Helen Thibodeau		22 Sullivan Road, PO Box 97	Greene	ME	04236	70171000000074673885
Richard and Ida Pipkin Heirs		8 Petticoat Acres Lane	Whitefield	ME	04353	70141200000089806729
Richard and Susan Stukas		144 Ferry Road	Lewiston	ME	04240	70141200000089809249
Richard B. Gould Jr		663 Bigelow Hill Road	Skowhegan	ME	04976	70141200000089810009
Richard Doe		104 Griffin Road	Windor	ME	04363	70141200000089806026
Richard Dube		1808 Lisbon Street	Lewiston	ME	04240	70141200000089809041
Richard E. and Elizabeth Metterville		223 Happy Hollow Road	Oakham	MA	01608	70141820000089564474
Richard Eastman		5 Rose Ridge	Jay	ME	04239	70171000000074674028
Richard Gray		1294 Anson Road	Starks	ME	04911	70141200000089827700
Richard J. & Jodi L. Godin		21 Shady Lane	Embsden	ME	04958	70141820000089564740
Richard J. Cushing		P.O. Box 373	Wilton	ME	04294	70141200000089806644
Richard Kupis		26 Great Hill Road	Portland	CT	06480	70141820000089564443
Richard L. Cummings, Jr.		P.O. Box 142	Windor	ME	04363	70141200000089806712
Richard M. Parkinson		26 Bert Berry Road	Embsden	ME	04958	70141820000089564467
Richard Mattucci &	Sandra Brown	373 Wiscasset Road	Whitefield	ME	04353	70141200000089806705
Richard Noblet		43 Cardinal Drive	Embsden	ME	04958	70141820000089564733
Richard P. & Daniel L. Wallace		5 Goddard Street	Bath	ME	04530	70141200000089826673
Richard R. and Maureen Chase		175 Wiscasset Road	Whitefield	ME	04353	70141200000089806699

Owner (1st Owner, Full Name)	Owner 2 (2nd+ Owner(s), Full Name)	Mailing Address	Mailing Town	Mailing State	Mailing ZIP	Tracking Number (Used After Mailing is sent)
Richard Smith		15 Gordon Road	New Sharon	ME	04955	70141200000089828615
Richard Varney		226 Ferry Road	Lewiston	ME	04240	70141200000089809140
Richard Yocum		1404 Kennebec River Road	Emden	ME	04958	701418200000089564757
Richard, Donna, and Carolyn Gray & Rita A. Murray	Linda, Darlene, and Barbara Santiago	123 Madison Avenue	Madison	ME	04950	70141200000089827281
Robert A. and Roxanne Metterville		147 Tremont Street	Carver	MA	02330	71041200000089827663
Robert and Audrey Hanscom		15 Prescott Street	Rutland	MA	01543	70141820000089564450
Robert and Brenda Long		16 North Line Road	Greene	ME	04236	70141820000089562876
Robert and Carolyn Bigelow		58 Bartlett Lane	Eliot	ME	03903	70141200000089826765
Robert and Lisa-Anne Berry		PO Box 13	Passumpsic	VT	05861	70141200000089828936
Robert and Lorna Garland		112 Belanger Road	Jay	ME	04239	70141820000089563101
Robert and Sharon Clark		191 Owen Mann Road	Farmington	ME	04938	70141200000089807948
Robert and Timothy Stewart		155 Dyer Road	Lewiston	ME	04240	70141200000089809232
Robert Blagden		58 Curtis Road	Freeport	ME	04032	70141200000089826871
Robert D. El. Pond	c/o Richard Pond	842 Gardiner Road	Wiscasset	ME	04578	70141200000089808693
Robert J. and Wanda E. L. Wright		25 Pond Park Road	Naples	ME	04055	70141200000089827670
Robert J. Burns		3 Grainfield Court	Cantonville	MD	21228	70141820000089564726
Robert J. Randazzo, Jr.		197 Coopers Mills Road	Windsor	ME	04363	70141200000089806019
Robert L. Smith		126 Western Avenue #186	Augusta	ME	04330	70141200000089806002
Robert M & Janet L. Avallone		416 McCrillis Corner Road	Wilton	Maine	04294	70141200000089806392
Robert McCarty & Robert S. Parlin	Carol Denton	77 Fahi Pond Road	N. Anson	ME	04958	70141200000089807917
Robert Sirois		PO Box 573	Skowhegan	ME	04976	70141200000089808099
Robert Zenus		90 Gardiner Road	Whitefield	ME	04353	70141200000089806682
Roberta Chase		249 Seamon Road	Farmington	ME	04938	70141200000089809904
Roberta J. Duhaime		67 Thingvalla Avenue, Apt 4	Cambridge	MA	02138	70141820000089563262
Robin and Angela Lilley		79 Wiscasset Road	Whitefield	ME	04353	70141200000089806675
Robin Staier		275 Bolton Road	Bolton	MA	01740	70141200000089827687
Rodney and Linda Jennings		36 White Oak Hill Road	Poland	ME	04274	70171000000074671652
Rodney and Susan Bates		36 Key West Avenue	Winter Haven	FL	33880	70141820000089562968
Rodney Bridges		92 Fish Street	Leeds	ME	04263	70141820000089563811
Rodrigo Giraldo		46 Addition Road	Greene	ME	04236	70141820000089562777
Roger and Judith Caeuette		389 Weeks Mills Road	Farmington	ME	04938	70141200000089809805
Roger and Rejeanne Bosse & Roger and Sandra Belanger	Rolande Lachapelle	65 East Haverhill Street	Lawrence	MA	01841	70141200000089828608
Roger Beaulieu		592 Foreside Road	Topsham	ME	04086	70141200000089826666
Roger Belanger		136 Merrill Road	Lewiston	ME	04240	70141200000089809034
Roger Morissette	c/o Germaine Morissette	PO Box 2102	Lewiston	ME	04241	70141200000089809133
Roland Chretien		1225 Sabattus Street	Lewiston	ME	04240	70141200000089809225
Roland Grant		104 Ferry Road	Lewiston	ME	04240	70141200000089809027
Ronald & Kathy Ingersoll		202 North Daggett Hill Road	Greene	ME	04236	70171000000074673878
Ronald & Marcia Turcotte		72 Karn Road	Livermore Falls	ME	04254	70141200000089829384
Ronald and Angela Meserve		2012 Lyndale Lane	Billings	MT	59102	70141200000089808594
Ronald and Lisa Bolduc		24 Beaudoin Road	Moscow	ME	04920	70141200000089828936
Ronald E. Titcomb Living Trust	c/o Ronald E. Titcomb & Shirley Helms, Trustees	282 Upper Sumner Hill Road	Sumner	ME	04292	70141200000089829377
Ronald Lambert		29 Hardscrabble Lane	Richmond	ME	04357	70141200000089826772
Ronnie and Carol Charest		347 Harris Hill Road	Poland Spring	ME	04274	70141200000089809126
Rosemary & Talbot Campbell Sr.		612 Mountain Road	Woolwich	ME	04579	70141200000089805470
Ross Callon		23 Packard Road	Greene	ME	04236	70141820000089562869
Rotary Auto Sales LLC		1759 Main Street	Lewiston	ME	04240	70141200000089807450
Roxanne R and Kenneth Wilson		435 Jones Wood Road	Newcastle	ME	04553	70141200000089808495
Roy and Aleene Barnes		11 Applewood Drive	Westford	MA	01886	70141200000089827632
Roy Burgess III		PO Box 1510	Lewiston	ME	04241	70141200000089807474
Roy Denham		499 Townhouse Road	Whitefield	ME	04353	70141200000089806668
RSU #9		131 Old Stage Road	Wiscasset	ME	04578	70141200000089805463
Rumrill Preservation Group	c/o Mac Capital Partners, Inc.	PO Box 64	Leeds	ME	04263	70141820000089564030
Russell and Joanne Burns		309 Wiscasset Road	Whitefield	ME	04353	70141200000089806651
Russell and Randall Norris		115 Learning Lane	Farmington	ME	04938	70141200000089809977
Russell M. and Jennifer L. Davis		2250 Hickory Road, Suite 450	Plymouth Meeting	PA	19462	70141200000089805456
Russell Steward		PO Box 45	Anson	ME	04911	70141200000089807993
Ruth Cushing		89 Western Avenue	Biddeford	ME	04005	70141200000089829360
Salim and Nadine Naous		615 Augusta-Rockland Road	Windsor	ME	04363	70141200000089805999
Sally A. Parsons		2548 Kennebec River Road	Concord Twp.	ME	04920	70141820000089562005
Sally and Merit Bean		465 Townhouse Road	Whitefield	ME	04353	70141200000089806644
Sally Ann Austin		176 Ferry Road	Lewiston	ME	04240	70141200000089807474
Sam and Carolina Miller		420 McCrillis Corner Road	Wilton	ME	04294	70141200000089809898
Sandra and Charles Picard		268 Center Road	Madrid Twp.	ME	04966	70141200000089809799
Sandra and Ronald Roy		38 Hillman Ferry Road	Livermore Falls	ME	04254	70141200000089829353
Sandra E. Gibbs Family Trust		205 Gardiner Road	Whitefield	ME	04353	70141200000089806637
Sandra L. Griffin		121 Devine Road	Whitefield	ME	04353	70141200000089806620
Sandra Noury		133 Second Street	Auburn	ME	04210	70141200000089807481
Sandra Thompson		67 Heald Street Apartment 2B	Madison	ME	04950	70141200000089827649
Sarah Brusila		168 Barlen Street	Farmington	ME	04938	70141200000089809980
Sarah King		178 Spring Road	Pittsfield	ME	04967	70141200000089828929
Sargent Realty, LLC		671 Troutdale Road	The Forks	ME	04985	70141200000089826864
SBA Towers II LLC		44 Emery Road	Starks	ME	04911	70141200000089827656
Scott Adams		228 South Street	Hanson	MA	02341	70141820000089563354
Scott and Cecilia Cater		PO Box 435	Stillwater	ME	04489	70141200000089829995
		8051 Congress Avenue	Boca Raton	FL	33487	70141200000089830007
		50 Beaudoin Road	Moscow	ME	04920	70141200000089828912
		295 Griffin Road	Windsor	ME	04363	70141200000089805982

Owner (1st Owner, Full Name)	Owner 2 (2nd+ Owner(s), Full Name)	Mailing Address	Mailing Town	Mailing State	Mailing ZIP	Tracking Number (Used After Mailing is sent)
Scott and Elizabeth Fenwick		218 Middle Road	Cumberland	ME	04021	7014120000008910078
Scott and Sandra Eustis		166 Old Webster Road	Lewiston	ME	04240	7014120000008929988
Scott J. Giguere		PO Box 433	N. Anson	ME	04958	70141200000089807887
Scott Laweryson		PO Box 704	Bingham	ME	04920	70141200000089828905
Scott Record		PO Box 1558	Lewiston	ME	04241	70141200000089829971
Scott Robert		89 West Shore Drive	Greene	ME	04236	70141820000089562760
Scott Robert Colby		28 Rumerill Road	Wiscasset	ME	04578	70141200000089805449
Scott Sears &	Renee Bisette	71 Oakville Street	Lynn	MA	01905	70141820000089563255
Seaver and Anne Leslie		P.O. Box 248	Wiscasset	ME	04578	70141200000089805432
Seth Kempton		136 Wilton Road Apt. B.	Farmington	ME	04938	70141200000089809881
Shane and Sandra Lovely		64 Crocketts Beach Road	Owls Head	ME	04854	70141200000089828721
Shane Michael Baker		899 New Vineyard Road	New Vineyard	ME	04956	70141200000089827274
Shaw Bros. Enterprises		215 Middle Road	Cumberland	ME	04021	70141200000089810085
Shawn and Christopher Atwood		280 Stream Road	Moscow	ME	04920	70141820000089561961
Shawn and Ridge Barnes		568 Gardiner Road	Wiscasset	ME	04578	70141200000089805425
Shawn Laverdiere	c/o Roger and Gail Laverdiere	6 Prospect Street	Livermore Falls	ME	04254	70171000000074674004
Shawn Sanford		21 Quaker Ridge Road	Greene	ME	04236	70171000000074673861
Sheepscot Hollow, LLC		28 Nilsen Lane	Whitefield	ME	04353	70141200000089806613
Sheepscot Links		822 Townhouse Road	Whitefield	ME	04353	70141200000089806606
Sheepscot Valley Builders	c/o Troy Prescott	P.O. Box 341 - Suite 1	South China	ME	04358	70141200000089806590
Sheldon and Claudette King		210 North Daggett Hill Road	Greene	ME	04236	70141820000089562852
Sheldon and Judith Bubier		PO Box 203	Greene	ME	04236	70171000000074671690
Sheldon Leppala		212 North Daggett Hill Road	Greene	ME	04236	70171000000074673854
Sherene Roberts		433 Mayhew Road	Starks	ME	04911	70141200000089827618
Sherman & Sharon Adams		1691 Industry Road	Industry	ME	04938	70141820000089562951
Sherman Jenney		5583 Miles Drive	Port Orange	FL	32127	70141200000089826659
Sherri R. and Henry J. Talbot		41 Highland Terrace	North Monmouth	ME	04265	70141200000089805975
Sherrie L. Cummings		13 Waugh Road	Emden	ME	04958	70141820000089564719
Sherry Boudreau		214 Hunts Meadow Road	Pittston	ME	04345	70141200000089806583
Shila I. and Robert L. Gove		27 Baker Road	Windsor	ME	04363	70141200000089805937
Shirley & Paul Meite Jr.		328 West Alna Road	Alna	ME	04535	70141200000089808686
Shirley E. Bailey		639 Bailey Hill Road	Farmington	ME	04938	70141200000089809782
Shirley H. Cornue Living Trust	c/o Shirley Cornue, Trustee	420 Wheatstone Place	Cotter	AR	72626	70141820000089561749
Shirley Isbister		210 Griffin Road	Windsor	ME	04363	70141200000089805951
Skyla Murray		5 Redneck Road	Starks	ME	04911	70141200000089827625
Spencer Vermette		PO Box 363	Bingham	ME	04920	70141200000089828882
St. Francis Mission		344 Route 202, PO Box 100	Greene	ME	04236	70141820000089562845
Stanton Bird Club		PO Box 3172	Lewiston	ME	04241	70141200000089829940
Starks Town Office	c/o Jennifer Zweig Hebert, Town Clerk	57 Anson Road	Starks	ME	04911	70141820000089565006
State of Maine		State Office Building	Augusta	ME	04333	70141200000089808044
State of Maine Department of Conservation		22 State House Station	Augusta	ME	04333	70141820000089563934
State of Maine, Bureau of Parks and Recreation		22 State House Station	Augusta	ME	04333	70141820000089563842
Stayley Wetmore		515 Webster Road	Farmington	Maine	04938	70141200000089806415
Stephen and Anna Racioppi		88 Granite Farm Hill Road	Durham	ME	04222	70141820000089562302
Stephen F and Carol P. Acedo		P.O. Box 73	Whitefield	ME	04353	70141200000089806576
Stephen Fairchild and Carol Dennis		240 Ferry Road	Lewiston	ME	04240	70141200000089829957
Stephen Giuffrida		112 Pittston Road	Whitefield	ME	04353	70141200000089806569
Stephen Griswold Family Trust	c/o Sue Santerre and Paul Cote	501 Danforth Road	Portland	ME	04102	70141200000089829940
Stephen Jacobs		961 Allen Pond Road, PO Box 442	Greene	ME	04236	70141820000089562753
Stephen Mason		233 Strickland Loop Road	Livermore Falls	ME	04254	70141200000089829346
Stephen Small		722 Bingham Road	Bingham	ME	04920	70141200000089828899
Stephen V. and Holly R. Torsey		651 Townhouse Road	Whitefield	ME	04353	70141200000089806552
Steve and Theresa Witham		20 River Trail	Leeds	ME	04263	70141820000089564023
Steve G. Jacques		16 Riverview Road	Jay	ME	04239	70141820000089563095
Steve Lizotte		233 Fickett Road	Pownal	ME	04069	70141200000089827762
Steve R. Cyr		PO Box 3001	Lewiston	ME	04243	70171000000047673847
Steven A. Everett		PO Box 198	Anson	ME	04911	70141200000089808082
Steven A. McGee Construction	c/o Steven McGee	537 High Street	West Gardiner	ME	04345	70141200000089806545
Steven A. Sr. and Debra A. Page		499 Route 219	Leeds	ME	04263	70141820000089563927
Steven and Christine Dostie		261 Carding Machine Road	Bowdoinham	ME	04008	70141820000089563835
Steven and Tammy Lauritsen		323 Shaker Road	Gray	ME	04039	70141200000089828714
Steven Harris		1581 Industry Road	Industry	ME	04938	70141820000089563347
Steven J. Grady		8 Jewett Lane	Whitefield	ME	04353	70141200000089806538
Steven Palain and Rachel Palain-Jalbert		282 Route 202	Greene	ME	04236	70141820000089562838
Steven R. and Christina Joslin		481 Park Street	Livermore Falls	ME	04254	70141200000089829339
Steven Simpson and Kathleen Butler-Simpson		444 Pond Road	Lewiston	ME	04240	70141200000089829926
Steven Steward		PO Box 212	Bingham	ME	04920	70141820000089561992
Steven W. Maclean		24 Bear Brook Road	Livermore Falls	ME	04254	70141200000089829322
Sue Gordon		PO Box 974	Farmington	ME	04938	70141200000089809973
Summer Rowe		112 Meadow Hill Road	Greene	ME	04236	70171000000074671683
Susan J. Sutter		992 Alna Road	Alna	ME	04535	70141200000089805418
Susan M. & Gallup C. Westcott, III		714 Wiscasset Road	Whitefield	ME	04353	70141200000089806521
Suzanna Willey		P.O. Box 572	Casco	ME	04015	70141820000089564436
Sylvia Skillin		5 Ivy Place	Falmouth	ME	04105	70141200000089808587
Tammy & Alan Gray		11 Ordway Street	Georgetown	MA	01833	70141200000089807986
Tea Room, LLC.		25 Buttonwood Lane	Lewiston	ME	04240	70141200000089809874
Teresa M. Mitchell		235 Griffin Road	Windsor	ME	04363	70141200000089805944
Terry L. Longley		PO Box 254	N. Anson	ME	04958	70141200000089807894

Owner (1st Owner, Full Name)	Owner 2 (2nd+ Owner(s), Full Name)	Mailing Address	Mailing Town	Mailing State	Mailing ZIP	Tracking Number (Used After Mailing is sent)
Tessa Robinson		7 Solon Road	N. Anson	ME	04958	70141200000089808068
Thaddeus and Merideth Millett		136 Highland Cliff Road	Windham	ME	04062	70141200000089828707
The Forks Plantation Town Office	c/o Town Clerk	2955 US-201	West Forks	ME	04985	70141820000089561374
The Patricia E. Schwartz Trust	c/o Patricia E. Schwartz	187 High Street	Exeter	NH	03833	70141820000089562098
The Sevigny Family Revocable Trust	c/o Robert Sevigny	38 Rivers Drive	Durham	ME	04222	70141820000089562142
Theophilus Vallas		48 Bonney Briar Drive	Plymouth	MA	02360	70141200000089828875
Thomas & Jennifer Curran		3 Cobbler's Lane	Beverly	MA	01915	70141200000089827243
Thomas & Pauline Emery		40 Seabury Road	York	ME	03908	70141200000089826758
Thomas Albert Hawksley		17 King Road	Windsor	ME	04363	70141200000089805937
Thomas and Dorothy Denaro		23 Hubbard Hill Road	Derry	NH	03038	70141200000089807849
Thomas and James Helps		10 Mears Farm Road	Haverhill	MA	01830	70141200000089809775
Thomas and Jana Swengel		661 Church Hill Road	Leeds	ME	04263	70141820000089564016
Thomas and Paula Benne		587 Townhouse Road	Whitefield	ME	04353	70141200000089806545
Thomas and Rochelle Hart		158 Old Lisbon Road	Lewiston	ME	04240	70141200000089829896
Thomas J. & Janice E. Daku		197 Webster Road	Farmington	ME	04938	70141200000089809935
Thomas K. Bowie		32 Cloutier Road	Durham	ME	04222	70141820000089562111
Thomas M. and Lee Ann Szelog		P.O. Box 36	Whitefield	ME	04353	70141200000089806507
Thomas McNeil		PO Box 113	Pittsfield	ME	04967	70141200000089828868
Thomas N. & Kimberly A. Dellarma		164 West Sandy River Road	Mercer	ME	04957	70141200000089826857
Thomas R. Dillon Jr., Trustee & Thomas Smith	Joyce G. Dillon, Trustee	PO Box 296	Anson	ME	04911	70141200000089807979
Thomas Stukas		1567 Monte Stella Place	Manteca	CA	95337	7017100000074674080
Timothy and Bernadette Mynahan		144 Ferry Road	Lewiston	ME	04240	70141200000089829919
Timothy and Kathryn Jeffcoats		173 Dyer Road	Lewiston	ME	04240	70141200000089829902
Timothy and Rae Chute		999 Allen Pond Road	Greene	ME	04236	7017100000074673830
Timothy J. Doherty		79 Campbell Road	Leeds	ME	04263	70141820000089563910
Tobey, Corey, Wylie and Sam Hight & Scott and Meridith Edmonds	c/o Louis Hight	29 Wood Road	Pelham	NH	03076	70141200000089828592
Todd and Cynthia Poulin		P.O. Box 387	Skowhegan	ME	04976	70141820000089564702
Todd and Lindsay Mullen		197 Dyer Road	Lewiston	ME	04210	70141200000089829896
Trevor and Deborah Farmer		32 Sawtelle Road	Oakland	ME	04963	70141200000089828851
Troy Warrell		57 Androscoggin Bluffs	Livermore Falls	ME	04254	70141200000089829278
Trudy & Barry Barclay		PO Box 731	Bingham	ME	04920	70141200000089828844
Trudy and John Leen, Jr.		128 Jackman Mills Road	Fayette	ME	04349	70141200000089829308
Tyler Abraham & Tyler S. Fournier	Jacqueline Mathieu	148 Fayette Road	Livermore Falls	ME	04254	70141200000089829292
United States of America	Appalachian National Scenic Trail	PO Box 422	Bingham	ME	04920	70141820000089561954
Vaughn A. and Erin J. Turner		348 Park Street	Livermore Falls	ME	04254	70141200000089829278
Vernon and Janice Hodgkin		PO Box 50	Harpers Ferry	WV	25425	70141200000089808037
Vicki Meyers & Victoria Plaisted	Becky & Christian Vigneault	74 Turner Lane	Windsor	ME	04363	70141200000089805920
Vincent H. Lord		1655 Main Street	Lewiston	ME	04240	70141200000089829889
Vinton Turner & Wade Gilbert		PO Box 117	N. Anson	ME	04958	70141200000089807863
Walter and Cynthia Slocum		40 Cedar Street	Westbrook	ME	04092	70141820000089563248
Walter and Louis Hight & Walter E. & Phyllis E. Coombs		P.O. Box 105	Windsor	ME	04363	70141200000089805913
Walter Leavitt	Nancy Basley	47 Groton School Road	Ayer	MA	01432	70141200000089808075
Walter R. Chiappini & Warren Smith		PO Box 834	Skowhegan	ME	04976	70141820000089561732
Watson L. and Edith M. Meck	Jane Edmunds	1204 Intervale Road	New Gloucester	ME	04260	70141200000089828691
Wayne & Kathy Croxford		22 Dyer Street	Skowhegan	ME	04976	70141820000089564689
Wayne Averill	Virginia L. Stanley	28 Growling Bear Drive	Brunswick	ME	04011	70141200000089827250
Wayne F. and Roberta G. Libby		842 West Alna Road	Alna	ME	04535	70141200000089808488
Wells Fargo Bank, N.A. Trustee for GMACM Mortgage	c/o OCWEN Loan Servicing	491 Wiscasset Road	Whitefield	ME	04353	70141200000089806491
Wendell E. Dunlap		42 Diamond Road	Livermore Falls	ME	04254	70141200000089829285
Wendy and Daniel Burr		980 Manor Lane	Southampton	PA	18966	70141200000089806477
Wendy L. Ayotte		373 Old Bath Road	Wiscasset	ME	04578	70141200000089805401
West Forks Plantation Town Office	c/o Town Clerk	1266 Alna Road	Alna	ME	04535	70141200000089808679
Weyerheuser Company		P.O. Box 244	North Anson	ME	04958	70141820000089564429
Whitefield Town Office	c/o Yolanda Violette, Town Clerk	1661 Worthington Road	West Palm Beach	FL	33409	70141200000089806477
Willard and Jane Simmons		438 Solon Road	N. Anson	ME	04958	70141820000089564696
William & Mary Murphy		248 Middle Road	Cumberland Center	ME	04021	70141200000089810146
William and Barbara Schneider		455 Auburn Pownal Road	Durham	ME	04222	70141820000089562081
William and Candy McIntyre		2955 US-201	West Forks	ME	04985	70141820000089562340
William and Deanna Newton		P.O. Box 89	Fairfield	ME	04937	70141200000089808020
William and Jane Hodgkins		36 Town House Road	Whitefield	ME	04353	70141820000089561398
William and Jennifer Gardiner		108 Rose Road	Greene	ME	04236	70141820000089562821
William and Laurie Gardner		18 Indian Camp Way	Gorham	ME	04038	70141200000089828837
William and Michelle Gladu		50 Rough Rider Road	Durham	ME	04222	70141820000089562159
William and Natalia Thompson		242 North Daggett Hill RD	Greene	ME	04236	7017100000074671676
William D. Russo		76 Bluff Road	Concord Twp.	ME	04920	70141820000089561978
William H. Bunting	c/o Thomas C. Chester, Trustee	68 Parkview Avenue	Livermore Falls	ME	04524	70141200000089829261
William Hyde Benson 2016 Special Investment Trust		66 Tidewater Lane	Yarmouth	ME	04096	70141820000089562166
William J. and Judith M. Villeneuve		435 Coopers Mills Road	Windsor	ME	04363	70141200000089805777
William Nichols, Jr.		189 Merrill Road	Lewiston	ME	04240	70141200000089829872
William O. Hopp		244 Nelson Road	Vassalboro	ME	04989	70141820000089561947
William R. and Barbara A. Sproul		515 McCrillis Corner Road	Wilton	Maine	04294	70141200000089806378
William Rogers		305 Gardiner Road	Whitefield	ME	04353	70141200000089806460
		400 E Wisconsin Avenue - Suite 300	Milwaukee	WI	53202	70141200000089827755
		10 Fawn Lane	Whitefield	ME	04353	70141200000089806453
		368 Park Street	Livermore Falls	ME	04254	70141200000089829254
		22 Taylor Street	Stamford	CT	06902	70141200000089827267
		173 Coopers Mills Road	Windsor	ME	04363	70141200000089805906
		PO Box 57	New Vineyard	ME	04956	70141200000089806446

Owner (1st Owner, Full Name)	Owner 2 (2nd+ Owner(s), Full Name)	Mailing Address	Mailing Town	Mailing State	Mailing ZIP	Tracking Number (Used After Mailing is sent)
William W. and Gail D. Brooke		41 Cooper Road	Whitefield	ME	04353	70141200000089806439
Williams Farms Inc.		644 River Road	N. Anson	ME	04958	70141200000089807962
Willie and Angeline Leahy		640 Winslow Road	Albion	ME	04910	70141200000089807870
Wilton Town Office	c/o Diane Dunham, Town Clerk	158 Weld Road	Wilton	ME	04294	701418200000089561381
Windsor Town Office	c/o Kelly McGlothlin, Town Clerk	523 Ridge Road	Windsor	ME	04363	701418200000089561404
Winn S. Smith		99 Eames Road	Embsden	ME	04958	701418200000089564672
Wiscasset and Quebec Rail Road Company		P.O. Box 525	Alna	ME	04535	70141200000089805890
Wiscasset Town Office	c/o Linda Perry, Town Clerk	51 Bath Road	Wiscasset	ME	04578	701418200000089561411
Woolwich Town Office	c/o Anthony Blasi, Town Clerk	13 Nequasset Road	Woolwich	ME	04579	701418200000089561428
York Family Trust	c/o Carroll York, Trustee	P.O. Box 144	Windsor	ME	04363	70141200000089805883
Yuri Kowalski		73 Cooper Ridge Road	Greene	ME	04263	70171000000074673823
Zephram de Colebi		75 Grove Road	Pitman	PA	17964	70141200000089805395

Attachment G
Affidavit from NECEC LLC



NEW ENGLAND
CLEAN ENERGY
CONNECT

AFFIDAVIT

Thorn C. Dickinson, being duly sworn, under oath, states that he is the President and Chief Executive Officer of NECEC Transmission LLC and as such is duly authorized to issue this affidavit on behalf of NECEC Transmission LLC, he has received, read, and understands the terms of the Order of the State of Maine Department of Environmental Protection dated May 11, 2020 that approved the Site Location of Development Act and Natural Resource Protection Act permits and water quality certification for the New England Clean Energy Connect Transmission Project (permits L-27625) (the "DEP Order"), and that NECEC Transmission LLC will comply with the DEP Order including any conditions therein with regards to the components that are transferred to NECEC Transmission LLC.

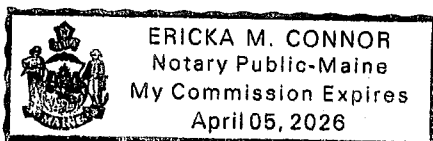
Thorn C. Dickinson
President and Chief Executive Officer
NECEC Transmission LLC

STATE OF MAINE)
) ss.
COUNTY OF CUMBERLAND)

Subscribed and sworn to (or affirmed) before me on this 24th day of September 2020, Thorn C. Dickinson, proved to me on the basis of satisfactory evidence to be the person who appeared before me.

Notary Public

My Commission Expires:



Attachment H
May 11, 2020 MDEP Order approving NECEC



DEPARTMENT ORDER

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY) SITE LOCATION OF DEVELOPMENT ACT
See Appendix A for Location) NATURAL RESOURCES PROTECTION ACT
NEW ENGLAND CLEAN) FRESHWATER WETLAND ALTERATION
ENERGY CONNECT) SIGNIFICANT WILDLIFE HABITAT
L-27625-26-A-N (approval)) WATER QUALITY CERTIFICATION
L-27625-TG-B-N (approval))
L-27625-2C-C-N (approval))
L-27625-VP-D-N (approval))
L-27625-IW-E-N (approval)) FINDINGS OF FACT AND ORDER

OVERVIEW

This Order conditionally approves Central Maine Power Company's applications for State land use permits for the New England Clean Energy Connect project. The record of this proceeding demonstrates that the project will satisfy the Department's permitting standards subject to the conditions in this Order. Issuance of this Order follows a 29-month regulatory review, which included six days of evidentiary hearings and two nights of public testimony. Twenty-two parties, consolidated into ten groups, participated in the evidentiary hearings by helping to shape the administrative review process, providing sworn testimony from dozens of witnesses, cross examining those witnesses, and submitting argument on the interpretation and application of relevant permitting criteria. Hundreds of Maine citizens testified during the public hearings and submitted written comment on the many issues the application presented. The hearing and public comment process provided the Department with critical information and analysis of the applicant's proposal, its impacts, whether and how those impacts can be mitigated, and the availability of alternatives.

The record shows the project as originally proposed would have had substantial impacts, particularly in the 53.1-mile portion of the corridor that extends from the Quebec border to The Forks, known as Segment 1. The record also shows that it is feasible to avoid or minimize those impacts through a variety of mitigation measures. This Order does so by imposing a set of conditions identified and developed through the public process. These conditions provide an unprecedented level of natural resource protection for transmission line construction in the State of Maine. They are also fully supported by the evidence. For example, the hearings highlighted the impacts the proposed project would have on fish and wildlife habitat, scenic character, and recreational uses of the Segment 1 area. The evidence shows that the width of the corridor, and the manner in which vegetation is managed within it, are key factors that drive the severity of those impacts. This Order limits the width of the cleared corridor in Segment 1 – originally proposed to be 150 feet – to 54 feet at its widest point. The Order requires the applicant to use poles in ecologically sensitive areas that are tall enough to preserve forest canopy. It requires that wildlife corridors be preserved in deer wintering area.

In all other portions of Segment 1, the Order requires that cutting of vegetation be limited and tapered tree growth be maintained within the corridor, significantly reducing the area cleared and minimizing visibility of the project. Herbicide use is prohibited throughout Segment 1. The combined effect of these conditions is to shrink the footprint of the project and reduce its overall impacts dramatically.

Some project impacts, however, will remain. The Order requires substantial measures to compensate for these impacts, including that the applicant conserve 40,000 acres in western Maine permanently. The conserved lands may be open to commercial forestry utilizing sustainable harvesting practices. The Order also requires the applicant to set aside \$1,875,000 for culvert replacements in western Maine, which includes the Segment 1 area. The evidence shows this should be adequate to fund 25 culvert replacement projects, which will enhance fish habitat by facilitating passage, reducing erosion, and improving water quality.

The hearings also focused on whether a practicable alternative exists to the applicant's chosen route and proposed design that would be less damaging to the environment. The evidence shows that it does not. The alternative routes potentially available are each problematic for their own reasons, including the need to cross or go around conservation lands such as the Bigelow Preserve, greater impacts to the Appalachian Trail, and an increase in cleared corridor area. Nor is the undergrounding alternative preferable. Record evidence supports the conclusion that undergrounding in Segment 1 may be so technically challenging as to be impracticable. Even if technically practicable, the trenching that undergrounding entails would result in greater impacts to natural resources such as wetlands. Undergrounding also would require a permanent clearing in Segment 1 that is 75 feet in width, almost 50% wider than the corridor clearing approved in this Order.

The applicant's stated purpose for this project is to provide renewable electricity from Quebec to the New England grid. The Department applied the statutes and regulations it administers in this Order to approve the least environmentally damaging alternative available to achieve that purpose. The Order puts in place a comprehensive set of conditions designed to avoid and minimize the project's impacts to the extent possible, while also requiring substantial offsite compensation for those impacts that remain. So conditioned, the project fully satisfies the Department's permitting standards.

ANALYSIS, FINDINGS, & CONCLUSIONS

Pursuant to the provisions of the Natural Resources Protection Act (38 M.R.S. §§ 481–489-E) (NRPA), the Site Location of Development Act (38 M.R.S. §§ 480-A–480-JJ) (Site Law), Section 401 of the Federal Water Pollution Control Act (33 U.S.C. § 1341), and Chapters 310, 315, 335, 373, 375, 376, 500 and 502 of the Department of Environmental Protection (Department) rules, the Department has considered the application of CENTRAL MAINE POWER COMPANY (CMP or applicant) with the supportive data, agency review comments, party comments, public comments, hearing materials, and other related materials on file and FINDS THE FOLLOWING FACTS:

1. PROJECT DESCRIPTION AND ADMINISTRATIVE BACKGROUND

A. History

CMP has been developing its transmission corridors over a period of years. Much of this development pre-dated the Site Law and the NRPA, but there also have been Department Orders issued in the past that have approved the construction of new electrical transmission lines, upgrades of existing electrical transmission lines and the construction or expansion of new and existing substations. Previous Department Orders issued for projects located in the transmission corridor at issue in this proceeding include the Maine Power Reliability Program (MPRP) #L-24620-26-A-N/ L-24620-TG-B-N/ L-24620-VP-C-N/ L-24620-IW-D-N/ L-24620-L6-A-N, dated April 5, 2010. Previous Department Orders issued for substation projects located within the corridor under consideration in this Order include: #L-T00822-TB-A-N (Surowiec Substation expansion in Pownal), dated September 8, 1999; #L-17973-26-AJ-M and #L-17973-26-AK-T (Maine Yankee Substation expansion in Wiscasset), dated December 15, 2006; and the MPRP Order. CMP submitted an application summarized below on September 27, 2017 for the New England Clean Energy Connect (NECEC) project seeking both a Site Law and NRPA permit. Portions of the proposed NECEC project are located on or adjacent to the projects listed above.

B. Overview

The applicant proposes to construct a 145.3-mile long, 320 kilovolt (kV) High Voltage Direct Current (HVDC) transmission line from Beattie Township to Lewiston; a converter station to convert the Direct Current (DC) electricity to Alternating Current (AC) electricity on Merrill Road in Lewiston; a new substation on Fickett Road in Pownal; and a 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. The applicant also proposes to rebuild several existing transmission lines and upgrade three substations. The HVDC portion of the transmission line will be placed on single steel poles that will average approximately 100 feet tall and will be spaced approximately 1,000 feet apart. The new 345-kV lines and the reconstructed 115-kV lines will be constructed on a variety of different structures, including 125-foot tall steel structures, 80-foot tall single pole structures, 75-foot tall, wooden H-frames, and 45-foot tall, wooden, single pole structures. The applicant divided the project into five transmission line segments and construction or upgrades of substations.

(1) Transmission Lines

a. Segment 1

Segment 1 starts at the Maine/Quebec border in Beattie Township and continues within a 300-foot wide right-of-way (ROW) to The Forks Plantation. Segment 1 is an approximately 53.1-mile long, 320-kV DC transmission line. The applicant proposes to use the southernmost 150 feet of the ROW for the Segment 1 corridor.

This segment is located primarily in working forest. Segment 1 crosses 480 freshwater wetlands; 280 rivers, streams, or brooks, of which 237 contain coldwater fisheries habitat, including the Upper Kennebec River, which is an Outstanding River Segment; six Inland Waterfowl and Wading Bird Habitats (IWWH) with 8.23 acres of conversion; and six Significant Vernal Pools (SVP).¹ As originally proposed, a 150-foot wide cleared corridor would have been created except for areas within 25 feet of rivers, streams, or brooks. Within 25 feet of these resources, the applicant originally proposed to remove all woody vegetation during initial clearing and subsequently to allow non-capable woody vegetation to grow up to ten feet tall outside the wire zone.

During the course of the permit review process, the applicant modified its proposal to include: (a) tapered vegetation within the corridor near Rock Pond and Coburn Mountain, (b) full canopy height vegetation near Gold Brook, Mountain Brook, and the Upper Kennebec River, (c) 25- to 35-foot tall vegetation managed for deer habitat in eight areas in the Upper Kennebec River Deer Wintering Area, and (d) 100-foot wide riparian filter areas² on either side of all perennial streams in Segment 1.³

In areas where the corridor will be tapered, instead of clearing the entire width of the 150-foot corridor only a 54-foot side section, centered under the conductors, will be cleared. Non-capable species⁴ of vegetation will be allowed to regrow in this area after construction, establishing scrub-shrub habitat with a height of approximately 10 feet. Taller, capable vegetation outside of this 54-foot wide area will be retained, with the height of the retained vegetation increasing from approximately 15 feet to 35 feet as the distance from the scrub-shrub area increases.⁵

On September 18, 2019, the applicant submitted a Petition to Reopen the Record to allow it to amend the pending application. The amendment modified the proposed route of a short section of the Segment 1 corridor in the area near Beattie Pond. This alternative, the Merrill Strip Alternative, as discussed below in Finding 7, initially was rejected by CMP due to the cost to obtain the land from the current landowner. The Merrill Strip Alternative is approximately 0.4 miles shorter than the originally proposed route, results in one less pole (also referred to as transmission line structure or structure), reduces the wetland impact by 12,286 square feet, and eliminates impacts to one SVP and one stream that contains brook trout.⁶

¹ As used in this Order, unless context clearly indicates otherwise, the term Significant Vernal Pool or SVP is used to refer to significant vernal pool habitat, which includes the significant vernal pool depression and that portion of the critical terrestrial habitat within 250 feet of the depression. See 06-096 C.M.R. Ch. 335, § 9.

² Appendix C discusses riparian filter areas.

³ This Order imposes substantial, additional conditions on the construction and maintenance of the Segment 1 corridor, for example, by requiring taller vegetation in 12 Wildlife Areas and tapering the entirety of Segment 1 outside of these areas.

⁴ Capable species are species capable of growing tall enough to reach into the conductor safety zone. Non-capable species are not capable of growing that tall and typically grow no taller than 10 feet.

⁵ Appendix C contains a discussion of different vegetation management along the corridor, including tapering and management for deer travel corridors.

⁶ The ROW obtained by CMP for the Merrill Strip Alternative is 150-feet wide. The remainder of the ROW within Segment 1 is 300-feet wide.

b. Segment 2

Segment 2 extends from The Forks Plantation to the Wyman Substation in Moscow and is a 21.9-mile long, 320-kV DC transmission line. The applicant proposes to co-locate Segment 2 with the existing line that runs from Harris Dam to the Wyman Substation. The corridor within the existing utility ROW will be widened by an average of 75 feet to accommodate co-location of the proposed transmission line. Segment 2 is located primarily in working forest. Segment 2 crosses 146 freshwater wetlands; 68 rivers, streams, or brooks, 46 of which contain coldwater fisheries habitat; two IWWHs with 1.13 acres of conversion; and two SVPs. With the exception of areas within 100 feet of coldwater fisheries, the corridor will be widened an average of 75 feet and maintained as scrub/shrub vegetation following construction. Within 100 feet of coldwater fisheries and 75 feet of other rivers, streams and brooks, the applicant proposes to remove all woody vegetation during initial clearing for construction and subsequently allow non-capable woody vegetation to grow up to 10 feet tall outside the wire zone.

c. Segment 3

Segment 3 runs from the Wyman Substation in Moscow to the proposed Merrill Road Converter Station in Lewiston. This segment is 71.1 miles long and is co-located with transmission lines in an existing ROW. This segment also includes the rebuilding of 0.8 miles of 345-kV AC line outside the Larrabee Road Substation and constructing 1.2 miles of new 345-kV AC transmission line from the Merrill Road Converter Station to the Larrabee Road Substation. The utilized portion of the ROW will be widened by an average of 75 feet. Segment 3 crosses: 489 freshwater wetlands; 235 rivers, streams, or brooks, of which 138 contain coldwater fisheries habitat, including the Kennebec River, the Carrabassett River, and the Sandy River, which are Outstanding River Segments; eight IWWHs with 5.65 acres of conversion; and 40 SVPs. With the exception of areas within 100 feet of coldwater fisheries and 75 feet of other rivers, streams and brooks, the corridor will be widened an average of 75 feet and maintained as scrub/shrub vegetation following construction. Within 100 feet of coldwater fisheries and 75 feet of other rivers, streams, and brooks, the applicant proposes remove all woody vegetation during initial clearing for construction and subsequently allow non-capable woody vegetation to grow up to 10 feet tall within the wire zone.

d. Segment 4

Segment 4 consists of: rebuilding 16.1 miles of 115-kV AC transmission line between the Larrabee Road Substation and the Surowiec Substation; rebuilding 9.3 miles of 115-kV AC transmission line between the Crowley's Substation and the Surowiec Substation; and constructing a new 345-kV AC transmission line from the Surowiec Substation to a proposed substation on Fickett Road in Pownal. Segment 4 will not require any additional clearing but will result in 0.006 acres of SVP upland fill and 0.02 acres of wetland fill. Segment 4 crosses: 132 freshwater wetlands; 33 rivers, streams, or brooks, 23 of which contain coldwater fisheries habitat; no IWWHs; and 10 SVPs.

e. Segment 5

Segment 5 consists of a proposed 26.5-mile long 345-kV AC transmission line from the existing Coopers Mills Substation in Windsor to the Maine Yankee Substation in Wiscasset within an existing corridor; partial rebuilding of 0.3 miles of 345-kV AC line near the Coopers Mills Substation; rebuilding a 0.8-mile section of 345-kV AC line near the Coopers Mills Substation; and rebuilding a 0.8-mile section of 115-kV AC line outside the Coopers Mills Substation. Segment 5 will not require any additional clearing and will result in 0.03 acres of wetland fill and 3.6 acres of DWA conversion. Segment 5 crosses 157 freshwater wetlands; 104 rivers, streams, or brooks, including the West Branch of the Sheepscot River, which is an Outstanding River Segment, and all of which contain coldwater fisheries habitat; two IWWHs; and four SVPs.

(2) Substations

a. Merrill Road Converter Station

The Merrill Road Converter Station will convert DC electricity from Canada to AC electricity to be fed into the power grid. The converter station will be located immediately adjacent to the transmission corridor, and with the access road, will occupy 13.4 acres of the site. The proposed converter station will result in 3.16 acres of wetland fill and 0.273 acres of fill in a SVP.

b. Fickett Road Substation

The Fickett Road Substation will be constructed across Allen Road from the Surowiec Substation and will occupy 4.87 acres of the site. The site currently contains existing 345-kV and 115-kV transmission lines, which were permitted as part of the MPRP. The substation will result in 1.33 acres of direct impact to a freshwater wetland.

c. Coopers Mills Substation

The Coopers Mills Substation was originally permitted as part of MPRP. Proposed work on the Coopers Mills Substation includes 345-kV bus work, circuit breaker installations, and relocating 345-kV transmission lines from the Maine Yankee Substation and the Larrabee Road Substation. These improvements will not require the existing yard to be expanded. The proposed work will result in 0.275 acres of new impervious area. No new impacts to any protected natural resource are proposed for this portion of the project.

d. Crowley's Substation

Proposed modifications at Crowley's Substation include the replacement of a 115-kV switch and bus wire. No new impervious area is proposed. No new impacts to protected natural resources are proposed for this portion of the project.

e. Larrabee Road Substation

The Larrabee Road Substation originally was permitted as part of the MPRP. The Larrabee Road Substation upgrades include the addition of a 345-kV line termination structure, a 345-kV circuit breaker, disconnect switches, instrument transformers, surge arrestors, buswork modifications, support structures, foundation modifications to the existing protection and control system, and network upgrades. The upgrades also include the replacement of an existing transformer with three single-phase autotransformers. The Larrabee Road Substation currently occupies 15.44 acres. These upgrades will result in 0.08 acres of new impervious area. No impacts to protected natural resources are proposed for this portion of the project.

f. Maine Yankee Substation

Proposed modifications at the Maine Yankee Substation involve the addition of a 345-kV three-circuit breaker bay, the relocation of the existing Coopers Mills 345-kV line, the addition of a terminal for the new 345-kV line from Coopers Mills Substation, and the repositioning of the existing 345-kV line from the Surowiec Substation. The substation currently occupies 4.91 acres. All proposed work will be in the existing yard and will result in 0.02 acres of new impervious area. No new impacts to protected natural resources are proposed for this portion of the project.

g. Surowiec Substation

Proposed additions at the Surowiec Substation include a terminal for a new 345-kV transmission line from the proposed Fickett Road Substation, a new dead-end A-frame structure, and a new 345-kV circuit breaker. The existing substation occupies 9.41 acres and all of the additions will be located within the existing yard. There will be 0.01 acres of new impervious area. No new impacts to protected natural resources are proposed for this portion of the project.

h. Raven Farm Substation

The Raven Farm Substation originally was permitted as part of the MPRP, which approved the construction of a 15.5-acre substation yard. Currently, the entire yard has been brought up to subgrade, but only half of the substation has been built to date. This half contains electrical equipment that was part of the MPRP. The proposed additions will be placed on top of a layer of crushed stone and will be on the remaining half of the yard. The electrical equipment will include a new 345/115-kV autotransformer and three new 115-kV transmission line terminations with associated equipment and foundations. No new wetland impacts are proposed for this portion of the project.

(3) Overall

The project, in its entirety, is shown on a set of plans, the first of which is entitled “New England Clean Energy Connect Existing and Proposed ROW Segment 1,” prepared by

Central Maine Power, and dated April 11, 2017, with a last revision date of September 18, 2019. The project site is located in 24 municipalities, 14 townships/plantations, and seven counties. (See Appendix A.)

C. Title, Right, or Interest

Applicants for Site Law and NRPA permits are required by 06-096 C.M.R. Chapter 2, § 11(D) to submit evidence demonstrating that they have sufficient title, right, or interest in all the property proposed for development. This can be in the form of deeds, leases, or easements, among other forms. The applicant submitted deeds or leases for the entire project. Several members of the public and Intervenor Groups 2 and 8 (see discussion of the public hearing below for a list of intervenor groups) contend that CMP does not have sufficient title, right, or interest in one portion of the corridor. Specifically, they question the legality of the lease CMP entered into with the Bureau of Parks and Lands for the corridor across West Forks Plantation and Johnson Mountain Township T2R6 BKP WKR. That lease decision was never appealed and is therefore final. The Department accepts the decision of its sister agency to enter into the leases and the fully executed leases as sufficient title, right, or interest in that portion of the proposed corridor to apply for permits for the project.

At the time of the initial submission of the application, CMP submitted a Letter of Understanding between CMP and the Passamaquoddy Tribe pertaining to a section of the corridor in Lowelltown Township. That Letter of Understanding stated that parties would negotiate in good faith the terms of a lease. The Letter of Understanding had an expiration date of January 31, 2018. At the request of Department staff, the applicant submitted a signed lease for the property, dated October 23, 2017. The lease term is 25 years and can be renewed. The lease has the signatures of representatives of the Passamaquoddy Tribe and CMP, but the copy submitted does not have a signature for a representative of the Bureau of Indian Affairs. These documents constitute sufficient showing of title, right, or interest in this portion of the proposed corridor for the Department to process the application. The Merrill Strip Alternative, which is described in more detail below, eliminates the portion of the line which was to be located on land owned by the Passamaquoddy Tribe.

D. Public Hearing

The Department accepted CMP's permit application for the NECEC project as complete for processing on October 13, 2017. On November 17, 2017, the Department's Commissioner determined that a public hearing would be held on this project pursuant to the Department's Rule Concerning the Processing of Applications and Other Administrative Matters, 06-096 C.M.R. Chapter 2, § 7(B). The Commissioner delegated the authority to conduct and preside over the hearing to Christina Hodgeman, an employee of the Department. The Presiding Officer's role was to conduct an adjudicatory hearing by administering governing procedural statutes and regulations and develop the administrative record.

The Presiding Officer's delegation did not include the ultimate decision-making authority, which was retained by the Commissioner.

On December 7, 2017, the Land Use Planning Commission (Commission) voted to hold a public hearing on the allowed use portion of the Certification process only, specifically with regard to whether the project is an allowed use within the Commission's Recreation Protection (P-RR) subdistrict. The Commission's role in the Department's proceeding would be to certify to the Department whether the project meets those land use standards administered by the Commission that are not duplicative of Department standards, and whether the project is an allowed use in the zoning subdistricts in which it is proposed. Utility facilities are allowed by special exception in the P-RR subdistrict. As originally proposed, the NECEC project crossed through three separate P-RR subdistricts, one around Beattie Pond, one near the upper Kennebec River crossing, and one near the crossing of the Appalachian Trail (AT). The Merrill Strip Alternative moved that portion of the project originally proposed in the P-RR Subdistrict around Beattie Pond outside of that subdistrict.

On June 27, 2018, the Department's Presiding Officer issued a notice setting July 19, 2018, as the deadline to submit petitions for leave to intervene. The Department received 23 petitions to intervene. On July 24, 2018, the Department requested more information from four of the petitioners and by July 31, 2018, three of those petitioners provided additional information, and one petitioner, the Sierra Club, withdrew its petition. On August 18, 2018, the Presiding Officer issued the First Procedural Order in the matter, and granted intervenor status to 22 parties. The parties granted intervenor status in the Department's proceeding were:

1. Old Canada Road National Scenic Byway (Old Canada Road)
2. Ed Buzzell
3. The City of Lewiston
4. Friends of the Boundary Mountains
5. The Appalachian Mountain Club (AMC)
6. Western Mountains and Rivers Corporation (WM&RC)
7. NextEra Energy Resources, LLC (Nextera)
8. Hawk's Nest Lodge
9. The Industrial Energy Consumer Group (IECG)
10. Natural Resources Council of Maine (NRCM)
11. The Town of Caratunk
12. The Maine State Chamber of Commerce
13. The International Brotherhood of Electrical Workers (IBEW)
14. Ashli Coleman
15. Maine Guide Services (MGS)
16. Brookfield White Pine Hydro, LLC (Brookfield)
17. Trout Unlimited (TU)
18. Chris Russell
19. The Nature Conservancy (TNC)
20. Maine Wilderness Guides Organization (MWGO)

21. The Conservation Law Foundation (CLF)
22. Mike Pilsbury

The first pre-hearing conference was held on September 7, 2018. At the conference the parties were notified that a consolidated hearing would be held by the Department and the Commission to make the two processes more efficient for the agencies, the applicant, the intervenors, and members of the public. In the Second Procedural Order, issued on October 5, 2018, the parties were notified of a new Presiding Officer. Presiding Officer Christina Hodgeman had left her position with the State of Maine and the Commissioner designated Susanne Miller, another employee of the Department, as the Presiding Officer. The Second Procedural Order granted intervenor status to Wagner Forest Management, Ltd. (Wagner), an entity that was not included in the Department's First Procedural Order. The Second Procedural Order also outlined how intervenor groups would be grouped together and consolidated for purposes of making the hearing more efficient.

These groupings are described below:

Group 1: Friends of Boundary Mountains, MWGO, and Old Canada Road. These intervenors were all opposed to the project and were intervenors for the Department proceeding only.

Group 2: West Forks Plantation, Town of Caratunk, Kennebec River Anglers, MGS, Peter Dostie (Hawk's Nest Lodge), and Mike Pilsbury. These intervenors were opposed to the project. With the exception of West Forks Plantation, all of the members of this group were intervenors in both the Department and Commission proceedings. West Forks Plantation was an intervenor in the Department proceeding only.

Group 3: IECG; City of Lewiston; IBEW; Maine Chamber of Commerce; and the Lewiston/Auburn Chamber of Commerce. These intervenors were in support of the project. With the exception of the Lewiston/Auburn Chamber of Commerce, all of the members of this group were intervenors in both the Department and Commission proceedings. The Lewiston/Auburn Chamber of Commerce was an intervenor in the Commission proceeding only.

Group 4: NRCM, AMC, and TU. These intervenors were opposed to the project, and were intervenors in both the Department and Commission proceedings.

Group 5: Brookfield and Wagner Forest Management, Ltd. These intervenors were neither for nor against the project. Both were intervenors in the Department's proceeding, but Wagner was also an intervenor in the Commission's proceeding.

Group 6: TNC and CLF. These intervenors were neither for nor against the project and were Department-only intervenors.

Group 7: WM&RC was in support of the project and was an intervenor in both the Department and Commission proceedings.

Group 8: NextEra. NextEra was opposed to the project and was an intervenor in both the Department and Commission proceedings.

Group 9: Office of the Public Advocate (OPA). The OPA was neither for nor against the project, was granted intervenor status in the Department⁷ proceeding, and was granted status as a governmental entity in the Commission proceeding.

Group 10: Edwin Buzzell, and “Local Residents and Recreational Users,” which included eleven individuals named in the Commission’s Second Procedural Order. These intervenors were opposed to the project. Edwin Buzzell was an intervenor in both the Department and Commission proceedings. The remaining individuals were intervenors in the Commission proceeding only.

After consideration of input from the parties, the Department’s Second Procedural Order identified the topics to be covered at the hearing. Those topics included:

- A. Scenic Character and Existing Uses – 38 M.R.S. § 480-D(1), 38 M.R.S. § 484(3), Department Rules 06-096 C.M.R. Chapters 315 and 375, § 14: The applicant must demonstrate that the proposed activity would not unreasonably interfere with the scenic character, or existing scenic, aesthetic, recreational, or navigational uses, and that the development fits harmoniously into the natural environment.
 - i. Visual Impact Assessment and Scenic/Aesthetic Uses
 - ii. Buffering for Visual Impacts
 - iii. Recreational and Navigational Uses
- B. Wildlife Habitat and Fisheries – 38 M.R.S. § 480-D(3), 38 M.R.S. § 484(3), and Department Rules 06-096 C.M.R. Chapters 335 and 375, § 15: The applicant must demonstrate that the proposed activity would not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, or threatened or endangered plant habitat.
 - i. Endangered Species – Roaring Brook Mayfly (RBM), Northern Spring Salamanders (NSS)
 - ii. Brook Trout Habitat
 - iii. Habitat Fragmentation
 - iv. Buffer Strips around Coldwater Fisheries
- C. Alternatives Analysis – 38 M.R.S. § 480-D (1) & (3), 38 M.R.S. § 484(3), Department Rules 06-096 C.M.R. Chapters 310, 315, and 335: The applicant must demonstrate that the proposed project would not unreasonably impact

⁷ While not explicitly stated in any of the Department’s Procedural Orders, the Office of the Public Advocate was granted intervenor status in the Department’s proceedings by the Department in a letter dated and signed August 31, 2018 by Presiding Officer Hodgeman.

“protected natural resources” as defined by the NRPA, in light of practicable alternatives to the proposal that would be less damaging to the environment. Topics for the hearing also included evidence addressing 38 M.R.S. § 480-D (8): The applicant must demonstrate that, with regard to the crossing of the outstanding river segment, no reasonable alternative exists that would have less adverse impact upon the recreational and natural features of the river segment.

- D. Compensation and Mitigation – 38 M.R.S. § 480-D, 38 M.R.S. § 484(3), Department Rules 06-096 C.M.R. Chapters 310 and 375, § 15. The applicant must demonstrate compensation for unavoidable impacts to certain resources.
- i. Coldwater Fisheries Habitats
 - ii. Outstanding River Segments
 - iii. Wetlands

On January 17, 2019, the Department and the Commission held a second pre-hearing conference to discuss logistics and planning for the hearing. At the conference, the Department and Commission stated that information in CMP’s application was sufficient to move forward with the hearing process. Intervenor requested inclusion of greenhouse gas emissions as a topic to be considered at the hearing, maps listing the submissions on title, right, or interest for the project, clarification on the timing of the close of the record, and postponement of the hearing and the filing deadlines for pre-hearing filings. In response to the requests, the Presiding Officers:

1. Granted parties until January 24, 2019, to submit, in writing and with the statutory and regulatory basis, a request for greenhouse gas emissions to be one of the hearing topics. Other parties would be allowed to respond to those requests until January 31, 2019.
2. Reiterated that the Department and the Commission had determined that they had sufficient information from CMP to demonstrate title, right or interest.
3. Denied requests to postpone the hearing, but agreed to consider postponing the pre-hearing filing deadlines.
4. Clarified that the date the record would close had not yet been determined.

CMP stated at the pre-hearing conference that it would provide maps to all intervening parties regarding title, right or interest, and provided these updated maps on January 25, 2019.

On January 24, 2019, Intervenor Group 4 filed a written request to include greenhouse gas emissions as a hearing topic and Intervenor Groups 2 and 10 filed a letter in support of that request. In the February 5, 2019 Third Procedural Order, the Presiding Officer determined that greenhouse gas emissions would not be included as a hearing topic. However, intervenors and the general public would be allowed to submit evidence including comments, data, and reports on this topic until the close of the record.

On February 1, 2019, Intervenor Groups 2 and 10 submitted a Motion for Reconsideration, requesting to postpone the hearing and the deadlines for the pre-hearing

filings. On February 4, 2019, Intervenor Group 4 submitted a letter in support of this motion. The Presiding Officer denied the February 1, 2019 Motion for Reconsideration in the February 5, 2019, Third Procedural Order and confirmed the dates for the hearing to be April 1 through April 5, 2019, at the University of Maine at Farmington.

On March 19, 2019, a Motion to Delay the Hearing and Allow Additional Testimony was filed, based on information that was submitted on March 18, 2019 from the Maine Department of Inland Fisheries and Wildlife (MDIFW). On March 21, 2019, the Department and Commission issued a joint Sixth Procedural Order that denied the motion.

On March 25, 2019, CMP submitted 469 pages of exhibits and rebuttal testimony and included five new rebuttal witnesses. On March 26, 2019, the third pre-hearing conference was held, by telephone. During the call the establishment of a potential additional hearing date was discussed.

The Department and the Commission issued a Seventh Procedural Order on March 28, 2019. This Order confirmed that an additional hearing day would take place May 9, 2019. The Seventh Procedural Order also allowed the intervenors to file sur-rebuttal testimony in response to CMP's March 25, 2019, filings.

The Department conducted five days of public hearing from April 1 through April 5, 2019, with the Commission joining the hearing on April 2, 2019. Two evening sessions were devoted to receiving testimony from the general public. The testimony from both the parties and the public generally focused on the impacts of Segment 1. Many of the witnesses in opposition to the project testified that the applicant failed to meet the licensing criteria regarding impacts to scenic character, recreational impacts, impacts to brook trout habitat, and impacts to water quality from herbicide applications. Witnesses in support of the project testified that the proposed project meets the licensing criteria because it would not cause an unreasonable impact and the applicant has proposed adequate compensation for the wildlife, wetland and scenic impacts that will occur.

On April 3, 2019, during the April hearing week, Intervenor Groups 2 and 10 filed a motion requesting additional public hearing time be scheduled for cross-examination of the applicant's engineers on questions that were deferred the first few days of the hearing. Many of the questions that were deferred were deferred to the applicant's and Group 3's sur-rebuttal witnesses who were not present during the April hearing. This motion was denied in the Ninth Procedural Order issued April 10, 2019. The order stated that time would instead be allotted for this purpose on the May 9, 2019 hearing date.

On April 19, 2019, the Department issued a Tenth Procedural Order in which the Department requested specific supplemental information from the Applicant to assist the Department with its analysis of the application and in an attempt to make the hearing process on May 9, 2019 more efficient.

The hearing continued on May 9, 2019, and the majority of testimony pertained to habitat fragmentation and the alternatives analysis, including the underground alternative.

At the close of the May 9, 2019, hearing, the Presiding Officer allowed the record to remain open for specific limited evidence to be entered into the record by May 17, 2019, and responses from parties to that evidence until May 24, 2019. The record also remained open for written comments from the general public until May 20, 2019, and then the parties' responses to those written comments from the general public until May 27, 2019.

On June 27, 2019, the Department and Commission conducted separate site visits to sites of interest pertaining to the project.

On October 3, 2019, at the applicant's request, the Presiding Officers issued the 15th Procedural Order reopening the record to allow the applicant to amend its application to propose the Merrill Strip Alternative route around Beattie Pond. On October 7, 2019, the Presiding Officers issued the 16th Procedural Order outlining the process by which the agencies would gather evidence on the Merrill Strip Alternative and providing a deadline for the parties and the public to submit comments.

2. FINANCIAL CAPACITY

Pursuant to the financial capacity standard of Site Law, and Chapter 373, § 2, the applicant must demonstrate financial capacity to design, construct, operate, and maintain the proposed development in a manner consistent with state environmental standards and the provisions of Site Law. The applicant must have the financial capacity for all aspects of the development and not solely the environmental protection aspects. Evidence regarding financial capacity must be provided prior to a decision on an application, except, pursuant to 38 M.R.S. § 484(1), the Department may defer a final finding on financial capacity by placing a condition on a permit that requires the permittee to provide final evidence of financial capacity before the start of any site alterations.

The applicant submitted financial capacity materials and a capital cost estimate with the original September 2017 Site Law application materials.⁸ During the application review process, the applicant submitted the following revised data relating to financial capacity:

- A. On December 12, 2017, the applicant submitted a total revised project cost estimate of \$949,745,330. Line items were included for various aspects of the design and construction of the project and included \$73,405,592 for erosion control and access roads.
- B. On July 31, 2018, the applicant submitted revised financial capacity documents, but did not change the total project cost estimate.
- C. On August 13, 2018, a revised project construction schedule was submitted, but the total project cost estimate remained unchanged.

⁸ The applicant requested that the original cost estimate data be protected from disclosure as a trade secret under Chapter 2, § 6(B) of the Department's rules, to which the Department agreed. In the December 2017 submission and further cost estimate submissions, the applicant stated that the revised cost estimates did not constitute a trade secret.

- D. On October 19, 2018, the applicant submitted a Site Law amendment application to incorporate horizontal directional drilling (HDD) of the line beneath the upper Kennebec River to avoid an overhead crossing. The applicant stated that the HDD alternative would not affect the line items or capital cost total of \$949,745,330.

The applicant proposed the project in response to a 2017 Request for Proposals for long-term contracts for clean energy projects issued by the Massachusetts Department of Energy Resources and the Electric Distribution Companies of Massachusetts. The proposed project was selected in 2018 as the winning bidder to deliver annually 9,450,000 megawatt-hours of clean energy generation. The applicant provided evidence demonstrating that the proposed project's costs will be recovered from Hydro-Quebec and Massachusetts electricity ratepayers in accordance with Federal Energy Regulatory Commission-approved transmission service agreements.

The applicant states that Central Maine Power Company and its parent companies, Avangrid, Inc. and Iberdrola, S.A., will finance the cost of the proposed project. This will be done using short-term and long-term debt financing and equity funding through retained earnings and capital contributions from Avangrid, Inc. The applicant submitted audited copies of Avangrid Networks, Inc. 2015 and 2016 Combined and Consolidated Financial Statements, and CMP's 2015 and 2016 Consolidated Financial Statement, as well as a letter of commitment to fund dated September 18, 2017, from Howard Coon, Vice President and Treasurer of Avangrid Management Company. These documents adequately demonstrate that the applicant will have adequate funds to construct, operate and maintain all aspects of the project.

In light of the significant cost associated with complying with the conditions of approval, prior to the start of construction, the applicant must submit additional information that confirms that it has the ability to finance the project at that time, including the ability to construct and operate the project in compliance with the terms and conditions of this Order. Prior to the start of construction, the applicant must submit evidence that it has been granted, to the extent necessary, a line of credit or a loan by a financial institution authorized to do business in this State or evidence of any other form of financial assurance consistent with Department Rules, Chapter 373, § 2(B), to the Department for review and approval.

Based on the information in the Department's administrative record, the Department finds that the applicant has demonstrated adequate financial capacity, provided the applicant:

- Submits evidence that it has been granted a line of credit or a loan by a financial institution authorized to do business in this State, or evidence of any other form of financial assurance consistent with Department Rules, Chapter 373, § 2(B), to the Department for review and approval prior to the start of construction.

3. TECHNICAL ABILITY

The applicant has a long history of operating and maintaining an electrical grid and the associated infrastructure. CMP is the largest transmission and distribution utility in Maine and serves 615,000 customers in southern, western, and central Maine. CMP currently operates and maintains over 2,536 miles of transmission lines and 254 substations, 63 of which are administered by ISO-NE.

Over the last 10 years, CMP has constructed approximately 500 miles of new transmission facilities in Maine. The applicant provided resume information for key persons involved with the proposed project and a list of projects CMP has successfully constructed. The applicant also retained the services of the following companies to assist in the permitting of the project.

- Burns and McDonnell for environmental matters, including noise
- Boyle Associates and Power Engineers for wetlands and vernal pool assessments
- T.J. DeWan and Associates for visual impact assessment
- MCBER and Daymark for economic consulting
- Powers Engineers for transmission line and substation design
- Dirigo Partners, Ltd. for real estate services

The Department finds that the applicant, through the combination of its institutional knowledge and experience, and its retained consultant expertise, has demonstrated the technical ability to develop the proposed project in compliance with Department standards.

4. NOISE

The Department's noise standards are set forth in Chapter 375, § 10. Section 10(B)(1) states that "when a development is located in a municipality which has duly enacted by ordinance an applicable quantifiable noise standard, which ... (1) contains limits that are not higher than the sound level limits contained in this regulation by more than 5 decibels (dBA), and (2) limits or addresses the various types of noises contained in this regulation or all types of noise generated by the development, that local standard, rather than this regulation, shall be applied by the Department within that municipality for each of the types of sounds the ordinance regulates."

In those municipalities without a local noise standard meeting these criteria, the project is required to meet the Department's noise standards. Chapter 375, § 10 applies hourly sound pressure level limits (LAeq-Hr) at facility property boundaries and at nearby protected locations. Chapter 375, § 10(G)(16) defines a protected location as "any location accessible by foot, on a parcel of land containing a residence or approved subdivision" In addition to residential parcels, protected locations include, but are not limited to, schools, state parks, and designated wilderness areas.

The hourly equivalent level resulting from routine operation of a development is limited to 75 dBA at any development property boundary as outlined in Chapter 375, § 10(C)(1)(a)(i). The hourly equivalent sound level limits at any protected location varies depending on local zoning or surrounding land uses and existing (pre-development) ambient sound levels. At protected locations within commercially or industrially zoned areas, or where the predominant surrounding land use is non-residential, the hourly sound level limits for routine operation are 70 dBA daytime (7:00 a.m. to 7:00 p.m.) and 60 dBA nighttime (7:00 p.m. to 7:00 a.m.).

At protected locations within residentially zoned areas or where the predominant surrounding land use is residential, the hourly sound level limits for routine operation are 60 dBA daytime and 50 dBA nighttime. In addition, where the daytime pre-development ambient hourly sound level is equal to or less than 45 dBA and/or nighttime ambient hourly sound level is equal to or less than 35 dBA, “quiet location” limits apply. For such “quiet locations,” the hourly sound level limits for routine operation are 55 dBA daytime and 45 dBA nighttime. At protected locations more than 500 feet from living and sleeping quarters, the daytime hourly sound level limits shall apply regardless of the time of day.

The Department finds that tonal sound exists if, at a protected location, one-third octave band sound pressure level in the band containing the tonal sound exceeds the arithmetic average of the sound pressure levels of two contiguous one-third octave bands by 5 dBA for center frequencies at or between 500 Hertz (Hz) and 10,000 Hz, by 8 dBA for center frequencies at or between 160 and 400 Hz, and by 15 dBA for center frequencies at or between 25 Hz and 125 Hz as outlined in Chapter 375, § 10(G)(24). For the purpose of determining compliance with the sound limits, 5 dBA shall be added to the observed levels of any tonal sounds that result from routine operation of the development, as outlined in Chapter 375, § 10(1)(d).

Several municipalities that the project passes through have their own noise regulations. The local regulations would be applied by the Department in place of the Department noise standards, provided that the local regulation meet the requirements of Chapter 375, § 10(B)(1), as described above. The municipalities with local regulations are: Lewiston, Greene, Leeds, New Sharon, and Pownal.⁹ None of these municipal ordinances contain provisions more restrictive than the Department’s nighttime standard for quiet areas – 45 dBA. As a result, if the proposed transmission lines satisfy the nighttime quiet area standard in Chapter 375, § 10, they also will satisfy the ordinance requirements of these municipalities. (As described below, the proposed transmission lines satisfy the Department’s nighttime quiet areas standard.)

⁹ See City of Lewiston’s Code of Ordinances, Appendix A, Section 19 (most restrictive standard is 50 dBA in residential areas); Town of Greene’s Code of Ordinances, Section 6-501.1 (most restrictive standard is 45 dBA between 10:00pm and 7:00am in residential zone); Town of Leeds’ Code of Ordinances, Section 5.F.14 (most restrictive standard is 45 dBA between 10:00pm and 7:00am in residential zone); Town of New Sharon’s Site Plan Review Ordinance, Section IV; and Town of Pownal’s Site Plan Review Ordinance, Article 4 (55 dBA).

Two municipalities in which the applicant proposes new or upgraded substations have their own noise standards, Pownal and Lewiston. Pownal's standard of 55 dBA, which is not limited to time of day, is more than 5dBA higher than the Department's quiet area nighttime standard of 45 dBA, which is the Department standard that applies to the project at the substation locations in Pownal. As a result, the Department does not apply Pownal's standard. Lewiston's ordinance establishes a 50-dBA limit in residential areas for all times of day. As discussed below, the substation locations in Lewiston are not located in quiet areas, so under the Department's rules the 60-dBA daytime and 50 dBA nighttime standards would apply. Even applying a 5-dBA penalty to account for potential tonal sound, Lewiston's standard is not more than 5 dBA less restrictive than the applicable Department nighttime standard. As a result, the Department must apply Lewiston's standard of 50 dBA pursuant to Chapter 375, § 10(B)(1).

A. Overview of Project Sound

The applicant hired Burns & McDonnell to study and model transmission line and substation sound levels for the project and to compare the model results to the applicable sound level standards. The Department retained the services Tech Environmental (TE) to conduct a peer review of the noise report.

(1) Construction Noise

Site Law, in 38 M.R.S. § 484(3)(A), exempts construction noise generated between the hours of 7 a.m. and 7 p.m. or during daylight hours, whichever is longer. The applicant has agreed to construct the project between 7 a.m. and 7 p.m., or during daylight hours with the exception of the HDD construction as the applicant proposed in its October 19, 2018 application amendment.

(2) Transmission Lines

The applicant proposes to use conductors that, under dry conditions, are nearly noise free. In high humidity and storm conditions these conductors would produce a slight crackling sound. The applicant modeled sound levels for the operations of new 345-kV AC and 320-kV HVDC transmission lines, using the Bonneville Power Administration (BPA) Corona and Field Effects Program to calculate the expected sound from the transmission lines. Based on the BPA model results for the project, the applicant expects all sound levels produced by new and/or upgraded transmission lines associated with the project to remain within the levels allowed under Chapter 375, § 10. The applicant calculated the 320-kV HVDC and 345-kV transmission line conductor noise levels at the edges of the various rights-of-way (ROWs), in fair weather. The results showed the noise level at the closest ROW edge (75 feet) would be well below the applicable noise standards, with the maximum fair-weather level expected to be 28 dBA. During foul weather or when the moisture content in the air is higher, the applicant states that the expected maximum sound produced by a conductor that is part of the project is expected to be 41 dBA at the edge of the ROW. This sound level would be produced by a 345-kV line.

The applicant notes this maximum is below the most stringent Department standard – a nighttime hourly sound level limit of 45 dBA.

The applicant's assessment and modeling results were reviewed by TE. In June 13, 2018 comments TE stated there was no supporting data in the reviewed materials for the acoustic modeling. TE further commented that the transmission line noise assessment should be updated to include tonal noise and discussion of the 5-dBA tonal sound penalty.

The applicant provided additional information on July 3, 2018. This information included the modeling assumptions and the amplitude of tonal noise.

The additional information demonstrated that under worst-case conditions, the maximum predicted sound level of 41 dBA at the transmission corridor ROW edge is not tonal in character and, thus, is below the Department's most restrictive limit. TE reviewed this information and, in its July 9, 2018 review memo, stated that the applicant's transmission line sound assessment was technically correct and complete.

(3) Substations

There are three existing substations that would be associated with the project – Maine Yankee Substation in Wiscasset, Surowiec Substation in Pownal, and Crowley's Substation in Lewiston – that do not require noise studies since the proposed modifications do not include the installation of significant noise emitting equipment or increase noise. The proposed project includes the construction of two new substations, the Merrill Road Converter Station in Lewiston and the Fickett Road Substation in Pownal; both include noise producing equipment. The proposed project also includes expansions at three existing substations at which the applicant does propose to install new noise producing equipment: the Larrabee Road Substation in Lewiston, Coopers Mills Substation in Windsor, and Raven Farm Substation in Cumberland.

At the two new substations, Burns & McDonnell personnel recorded ambient noise throughout the day and night to determine whether the areas would be considered quiet areas as defined in Chapter 375, § 10(C)(1)(v). The area around the Merrill Road Converter Station was determined not to be a quiet area. The area around the Fickett Road Substation qualified as quiet area. Additionally, short-term measurements were performed as part of the noise survey to establish operational sound levels of the existing substations. Burns & McDonnell took measurements at the fence lines of the existing substations in the directions of the nearest protected areas.

a. Merrill Road Converter Station

The proposed Merrill Road Converter Station consists of converter transformers, valves, reactors, capacitors, and switches. The substation converts DC power to AC power. The applicant monitored ambient sound levels and stated that the area around the proposed converter station is not a quiet area, since the ambient daytime and nighttime hourly

averages were 47 dBA and 39 dBA, respectively. The most restrictive Department standard, which applies to residential areas, would be a daytime limit of 60 dBA and a nighttime limit of 50 dBA. The City of Lewiston Code of Ordinances limits noise to 50 dBA during the day and night at the nearest residential property lines. Burns & McDonnell modeled the noise for this substation using CadnaA. The applicant's results showed that sound levels from the converter station would not exceed the applicable noise level standard, Lewiston's 50 dBA standard, at any of the adjacent residential property lines. The highest modeled result at any property line was 48.3 dBA.

TE reviewed the information and commented that the analysis did not include information on any possible tonal noise produced by the substation.

TE also stated that the analysis still needed the ground factor "G" used in the CadnaA modeling; octave band sound power levels for all noise sources used in the acoustic modeling; the CadnaA-predicted octave band sound levels, by source and the total, for receptor PL-5; and a discussion of tonal sound.

Burn & McDonnell responded to these data requests on July 3, 2018, providing the requested information and discussing Lewiston's ordinance. They reaffirmed the original modeling that showed the equipment selected will have sound levels no higher than 48.3 dBA at the nearest property line. This is under the City of Lewiston Ordinance standard of 50 dBA. TE reviewed this information and determined that the sound assessment was technically correct and complete and recommended that any new equipment installed at the Merrill Road Substation meet the sound power limits listed in Table 5-8 of the application.

b. Larrabee Road Substation

The applicant proposes to add 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 systems at the Larrabee Road Substation in Lewiston. According to the Burns & McDonnell noise study, the highest predicted sound level at a residential property line pertinent to this substation is 43.1 dBA. Lewiston's ordinance sound level limit for this portion of the project is 50 dBA at the nearest residential property line.

TE reviewed this information and requested that the applicant provide the ground factor "G" used in the CadnaA modeling. Burns & McDonnell provided the requested information on July 3, 2018. TE reviewed this information and application materials and determined that the sound assessment is technically correct and complete. TE recommended that any permit issued by the Department require that new equipment installed at the Larrabee Road Substation meet the sound power limits listed in application Table 5-11.

c. Fickett Road Substation and Surowiec Substation

Given space constraints at the Surowiec Substation in Pownal, the applicant proposes to construct the Fickett Road substation, which is across Allen Road from the Surowiec Substation. The Fickett Road Substation would house a static synchronous condenser (STATCOM) device, which does produce sound. The expansion at the Surowiec Substation would not generate any additional sound. The applicant proposes to expand the existing Surowiec Substation to facilitate the STATCOM at the Fickett Road Substation. The applicant proposes to add a 345-kV line terminal, 345-kV circuit breakers, disconnect switches, instrument transformers, surge arrestors, buswork modifications, support structures, foundations, and modifications to the existing protection and control system. All existing Surowiec Substation equipment is excluded from the analysis since the substation was constructed prior to 1970, and therefore is not subject to the Site Law.

Burns & McDonnell took measurements at the fence line and surrounding areas of the Surowiec Substation where the Fickett Road Substation would be constructed. A long-term noise meter was installed near the proposed substation to monitor ambient noise. The data showed that the area surrounding the substation would be considered a quiet area according to Department criteria since the daytime sound levels are below 45 dBA. As a result, the Department's sound level limits would be 55 dBA during the day and 45 dBA during the night at the property lines. The nearest residential receiver is located 500 feet from the substation. The noise impacts were modeled using a CadnaA noise model. The noise sources were determined not to have a tonal component. The applicant determined that the substation would not exceed noise level standards at the adjacent property lines.

TE reviewed the information and requested additional information on June 13, 2018. This information included providing the ground factor "G" used in the modeling, providing the octave band sound power levels used for modeling, and explaining whether the 5-dB penalty was added or not added to the results.

Burns & McDonnell responded on July 3, 2018 to this request. Burns & McDonnell summarized in this response that the highest predicted sound level, without a tonal penalty, would be 41.9 dBA. TE determined that the sound assessment was technically correct and complete and recommended that any new equipment installed at the Fickett Road Substation meets the sound power limits listed in Table 5-15 of the application.

d. Coopers Mills Substation

The applicant proposes to expand the existing Coopers Mills Substation located in Windsor. The expansion would require the addition of a 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, the substation work would require reconfiguration of the existing 345-kV lines.

The project also requires the addition of a +/-200 MVAR STATCOM to provided dynamic reactive support. The addition of the STATCOM would include multiple noise sources, which would increase sound levels at the property line and beyond.

Burns & McDonnell took short-term measurements at the fence line and surrounding the area of the substation. A long-term noise monitor was installed near the substation to monitor ambient noise. The measurements confirmed that the substation area would be considered a quiet area. Therefore, sound level limits would be 55 dBA during the day and 45 dBA during the night at residential property lines. The noise was modeled using CadnaA. The sound level was assessed using the 5-dBA penalty for tonal noise. The applicant determined that the sound levels from the substation would need to be mitigated to meet the applicable noise level standards at two of the adjacent residential property lines. The applicant proposes to mitigate with two sound walls, a 20-foot tall wall next to the main transformer and a 10-foot tall wall next to the STATCOM cooling fans, to lower the predicted sound levels below 45 dBA, assuming new sources produce tonal sound. TE reviewed this information and requested the applicant provide the ground factor "G" used in the CadnaA modeling, verify that the three existing transformers were included in the CadnaA model, and provide a firm commitment to construct the two sound walls described in the response to Information Request #8.

The applicant responded to these requests on July 3, 2018. TE reviewed the additional information and determined that the sound assessment for the Coopers Mills Substation is technically correct and complete. TE recommended that any permit issued require that new equipment installed at Coopers Mills Substation meet the sound power limits listed in the application Table 5-19, and the installation of the sound walls, as proposed by the applicant, with final design supported by additional acoustic modeling using vendor-supplied octave band sound power levels.

e. Raven Farm Substation

The applicant proposes to expand the terminal at the existing Raven Farm Substation in Cumberland. The applicant would add a 345-/115-kV, 448-MVA auto-transformer and a breaker, and one half 115-kV bus at the existing Raven Farm Substation.

Burns & McDonnell took measurements around the existing substation to establish the ambient sound level, as there is currently no noise emitting equipment on site. The measurements showed that the area surrounding the Raven Farm Substation would not be considered a quiet area. At five monitoring points daytime ambient sound levels ranged from 45.3 to 50.2 dBA, with nighttime levels ranging from 42.4 to 46.4 dBA. Therefore, sound level limits would be 60 dBA during the day and 50 dBA during the night at residential property lines. Since the substation will produce tonal noise, a 5-dBA penalty was applied by Burns & McDonnell. The modeling results included in the original application predicted the highest sound level at a property line, including a 5-dBA penalty, would be 49 dBA. The applicant later supplemented its application with The Raven Farm Substation Sound Study, prepared by Burns & McDonnell and dated May 17, 2018. This sound study contained updated modeling results that showed the highest

expected sound level, including a 5-dBA penalty, would be 44.6 dBA. This lower model estimate was the result of the applicant updating the transformer and associated sound pressure level. The transformer planned for in the sound study would emit less sound (75 dBA at 6 feet).

TE reviewed the Raven Farm Substation Sound Study and stated, in its July 9, 2018 review, that the study assessment is technically correct and complete. TE recommended that any permit by the Department require that the new transformer installed at the Raven Farm Substation meet the sound source limit for the base option listed in the study Table 6-1, a sound pressure level of 75 dBA at 6 feet.

B. Department Analysis and Findings

Based on the applicant's submissions, and with consideration of the comments provided by TE, the Department finds the applicant will construct the project between 7 a.m. and 7 p.m., or during daylight hours, with the exception of the HDD construction as the applicant proposed in its October 19, 2018 application amendment, and, therefore, will comply with the controlling statutory standard regulating construction noise. The Department finds the maximum sound generated by the new transmission lines proposed as part of the project will be approximately 41 dBA at the nearest edge of the ROW. This sound level is below the Department's most restrictive nighttime standard of 45 dBA and is also below the municipal standards in Lewiston, Greene, Leeds, and New Sharon.

With regard to the new substations and substation modifications, the Department finds the supplemented application materials assessing expected sound levels were complete and technically sound. The Maine Yankee Substation in Wiscasset, Surowiec Substation in Pownal, and Crowley's Substation in Lewiston, while part of the project, will not be modified in a way that will have a material impact on the noise generated at these facilities. The Department finds the project work at the Merrill Road Converter Station in Lewiston, the Fickett Road Substation in Pownal, the Larrabee Road Substation in Lewiston, the Coopers Mills Substation in Windsor, and the Raven Farm Substation in Cumberland will satisfy the applicable standards of Chapter 375, § 10, including any applicable municipal ordinance provisions, provided the applicant:

- For any new equipment at Merrill Road, Larrabee Road, Fickett Road, and Coopers Mills, installs equipment that meets the sound power limits listed in Appendix D, Table D-1 (incorporating the limits from the Site Law application, Tables 5-8, 5-11, 5-15, and 5-19);
- For any new equipment at Raven Farm, installs equipment that meets the sound power limit listed in Appendix D, Table D-1 (incorporating the base option listed in the Table 6-1 of the Raven Farm Substation Sound Study); and
- Installs sound walls at the Coopers Mills Substation, as proposed, with the final design supported by additional acoustic modeling using vendor-supplied octave band sound power levels, and submits the final design and modeling results to the Department for review and approval prior to operation of the new equipment at the substation.

5. SCENIC CHARACTER

Site Law, 38 M.R.S. § 484(3), and NRPA, 38 M.R.S. § 480-D(1), both have standards pertaining to scenic impacts that must be satisfied in order to obtain a permit from the Department. Pursuant to section 484(3), an applicant must make adequate provision for fitting the proposed project into the existing natural environment and the development may not adversely affect scenic character in the surrounding area. Pursuant to section 480-D(1), an applicant must demonstrate that the proposed project will not unreasonably interfere with scenic or aesthetic uses of protected natural resources.

A. Overview – Visual Impact Assessment

To address the scenic impact criteria, the applicant submitted a Visual Impact Assessment (VIA) prepared by Terrence J. DeWan & Associates. The VIA examined the potential scenic impacts of the transmission line and related substation upgrades by describing in both narrative and graphic forms the changes to the visual environment that may result from the project. The initial VIA included photosimulations from 32 key observation points (KOP) and also noted efforts taken by the applicant to avoid, minimize, and mitigate visual impacts. Through the course of the review process, the applicant responded to questions and comments about the VIA and provided additional information, including 21¹⁰ additional photosimulations. These photosimulations were submitted to provide additional evidence concerning the project's impacts when viewed from additional locations and at various times of the year.

As explained in the VIA and outlined in the applicant's witnesses' testimony, preparing the VIA involved the following steps:

- Develop project understanding
- Determine viewshed study area of potential effect (APE or study area) based on viewing distances
- Research, inventory, and identify scenic resources
- Prepare viewshed analysis to determine potential project visibility
- Perform fieldwork to document regional and local landscape character and site context
- Determine project visibility from identified scenic resources
- Prepare photosimulations from key observation points and other identified locations
- Rate potential visual impacts based on evaluation of photosimulations and other analysis
- Determine sensitivity levels of user groups
- Determine visual impact
- Develop mitigation recommendations

¹⁰ At several KOP multiple photosimulations were created depicting views of the project from different directions.

With regard to the identification of potentially impacted scenic resources, the applicant focused its assessment and inventory development on the area within three miles of the project, and within five miles if it would be viewed from an elevated area. These three/five-mile radius areas served as the APE. Within these areas the applicant identified scenic resources within the categories identified in Chapter 315, § 10.

The VIA also included a viewshed analysis. This consisted of both a topographic analysis and a landcover analysis. In the topographic viewshed analysis the areas from where the project would be visible were identified assuming no obstructions other than topography. Trees, buildings, and other obstructions were assumed not to exist. The landcover viewshed analysis incorporated structures and assumed 40-foot tall vegetation in forested areas.

Based on identified scenic resources and important public vantage points, the viewshed analysis, additional desktop analysis and GIS review, and on-the-ground field work, the applicant identified KOPs. The KOPs were intended to capture areas where the visual impact could be greatest, as well as reflect the project as a whole along the entire corridor and at the related substations. The applicant developed photosimulations for the KOPs. As noted above, through the course of the Department's review process additional photosimulations were produced, beyond the original 32. In total, 53 photosimulations were submitted, including photosimulations for the following locations¹¹:

Segment 1

- Beattie Pond, Lowelltown Township
- Wing Pond, Lowelltown Township
- Rock Pond, T5 R6 BKP WKR
- Fish Pond, Hobbstown Township
- No. 5 Mountain, T5 R7 BKP WKR
- Parlin Pond, Parlin Pond Township
- Coburn Mountain, Upper Enchanted Township
- Route 201, Johnson Mountain Township
- Attean View Rest Area, Jackman
- Kennebec Gorge, Moxie Gore (two locations with six different photosimulations)
- Moxie Stream, Moxie Gore

Segment 2

- Moxie Pond, East Moxie Township (three locations)
- Mosquito Mountain, The Forks Plantation (two locations)
- Troutdale Road, The Forks Plantation
- AT, Pleasant Pond Mountain, The Forks Plantation
- AT, Troutdale Road, Bald Mountain Township
- AT, Bald Mountain, Bald Mountain Township

¹¹The photosimulations for the Brookfield Alternative at Harris Dam are not included in this list.

Segment 3

- Wyman Lake Recreation Area, Pleasant Ridge Plantation
- Route 201, Moscow
- Route 8, Anson
- Route 2, Farmington
- Androscoggin Riverlands State Park, Leeds
- Merrill Road, Lewiston
- Sandy River, Farmington
- Carrabassett River, Anson

Segment 4

- Riverside Drive, Auburn
- Fickett Road Substation, Pownal

Segment 5

- Route 194, Whitefield
- Route 27, Wiscasset
- Route 1, Wiscasset
- West Branch Sheepscot River, Windsor (two locations)

Using the Department's Basic Visual Impact Assessment Form, the applicant rated impacts to the following resources as Minimal, Moderate, or Strong. This assessment was part of the VIA included in its initial application. Summaries of the applicant's descriptions of the impacts to each of these resources and the applicant's ratings are set forth below. Design changes made in the course of the review process that modified some ratings are also noted below.

Segment 1

- A. Beattie Pond – Beattie Pond is a remote pond with one camp located at the southeast end. Initially, the applicant proposed a transmission structure to be located 1,300 feet away, which would have been visible from the pond. At the request of the Commission and prior to the hearing, the applicant reduced the height of that one structure. The applicant subsequently, on September 18, 2019, proposed a different route called the Merrill Strip Alternative, which would further reduce the project's visibility from Beattie Pond. With the Merrill Strip Alternative route, existing vegetation and topography will screen structures, conductors, and shield wires from view from all but approximately 8 percent of the pond. Where visible, the tops of two structures, conductors, and shield wires could be seen in between the tops of trees at a distance ranging from approximately 0.75 to 1 mile. (Minimal, as revised)
- B. Wing Pond – Wing Pond is located in Lowelltown and Skinner townships and is recognized as a remote pond. The pond does not have a scenic resource rating, as

identified in the *Maine Wildlands Lake Assessment*¹². Views of the project from Wing Pond would include two structures and conductors within 1.75 miles. The visible portions of the project are within a recently harvested area visible from the pond. The contrast with the surrounding vegetation would be minimal since the structures would be self-weathering steel. (Minimal/Moderate)

- C. Rock Pond – Rock Pond is a 124-acre pond with a boat launch and campsites. The pond is rated as a Significant scenic resource by the *Maine Wildlands Lake Assessment*. Project structures and the corridor would be visible approximately 3,100 feet away from the Pond. A portion of the corridor visible from Rock Pond crosses Gold Brook, which contains Roaring Brook Mayflies (RBM) (see Finding 7 for a discussion of RBM).

At the request of the MDIFW several structures near Gold Brook were elevated to allow for full canopy vegetation within 250 feet of the brook.

This increased the visibility of those structures from Rock Pond. To minimize the visual impacts, the applicant proposed to taper vegetation in a portion of the corridor and use non-specular conductors¹³ in the areas where they would be visible from Rock Pond. (Moderate)

- D. Fish Pond – Fish Pond is located in Hobbstown Township and is rated a Significant scenic resource by the *Maine Wildlands Lake Assessment*. A boat launch is located on the northwestern end of the pond adjacent to a small campground; overall, the shoreline appears undeveloped. Project visibility would be very limited to the tips of up to four structures above the tree line at a distance of three to four miles. The corridor clearing will not be visible. (Minimal)
- E. No. 5 Mountain – No. 5 Mountain is located in T5 R7 BKP WKR and within the Leuthold Forest Preserve. The summit can be reached via an existing trail that is open to the public. The VIA states the project structures and corridor would be visible approximately 3.9 miles away. (Minimal/Moderate)
- F. Parlin Pond – Parlin Pond is a 543-acre pond with a boat launch, numerous camps, and a rest area. The pond is rated as a Significant scenic resource by the *Maine Wildlands Lake Assessment*. Project structures and the corridor would be visible at a distance of 1.8 miles or more from the pond. (Minimal/Moderate)
- G. Coburn Mountain – Also known as the Upper Enchanted Township Unit, the viewpoints from Coburn Mountain were designated as Scenic Viewpoints of State or National Significance in 2010. This designation was established for the purposes of evaluating impacts from grid-scale wind energy projects.

¹² The *Maine Wildlands Lake Assessment* is a report prepared by the Land Use Regulation Commission on June 1, 1987 that evaluated, among other things, the scenic quality of 1,500 lakes in the unorganized areas of the State.

¹³ Segal explained in her testimony on April 1, 2019 that non-specular conductors are pre-treated so they reduce potential reflectivity from sunlight.

The project corridor and numerous structures would be visible from the summit, which is accessible via a multi-use trail maintained by the Bureau of Parks and Lands. A small building, communications infrastructure, and a solar array are located at the top of the mountain. From the summit, the corridor will be visible in the midground looking toward the west side of the mountain at distances of 1.2 to 3.0 miles, and in the background (4+ miles) to the southeast. During the application review process, to address concerns and minimize the visual impact of the project, the applicant proposed tapering the vegetation in the corridor within the viewshed of Coburn Mountain and using non-specular conductors¹⁴ in this same area. (Moderate)

- H. Route 201 – Also known as the Old Canada Road Scenic Byway, Route 201 is designated as both a State and a National scenic byway. The 78.2-mile long byway will be impacted by both Segments 1 and 2. The VIA states that the project poles and conductors will be visible to motorists traveling on the byway. The applicant proposed to plant a vegetative, visual buffer along both sides of Route 201 at both crossing locations. (Moderate)
- I. Attean View Rest Area – From the rest area located on Route 201 the project will be visible at a distance of 7+ miles. (Minimal)
- J. Upper Kennebec River – The applicant modified the application, which originally included an overhead crossing, to incorporate an underground crossing using HDD technology. In the initial VIA with an overhead crossing the applicant rated the visual impact as Strong. Utilizing HDD to run the transmission line under the river results in no project visibility from the Kennebec River. (No visibility, as revised)
- K. Moxie Stream – This stream has been designated as scenic in the *Maine River Study*. The corridor and conductors would be visible at approximately 760 feet on the upstream side and approximately 1,000 feet on the downstream side. The line is proposed to be sited to avoid an adjacent open wetland which minimizes visibility from upstream. The structures would be set back more than 400 feet from the stream on the north side and more than 550 feet on the south side. Riparian vegetation, consisting of non-capable species, along the stream bank is proposed to be maintained and would minimize views into the corridor.¹⁵ The applicant also proposes to use non-specular conductors at this crossing. The VIA concludes the limited duration of exposure and screening effects of preserved vegetation result in minimal visual impact. (Minimal)

¹⁴ Use of non-specular conductors in the viewshed of Coburn Mountain was not discussed in the original VIA but is identified as part of the project in Exhibit CMP -5-C, pg. 7, included with Segal direct testimony for the hearing.

¹⁵ This order requires taller vegetation at the Moxie Stream crossing. (See Section 7 and Appendix C, Table C-1.) This taller vegetation will increase buffering of the corridor beyond the riparian vegetation and screening evaluated by the applicant in the VIA.

Segment 2

- A. Moxie Pond – Moxie Pond is a 2,370-acre pond rated as an Outstanding scenic resource by the *Maine Wildlands Lake Assessment*. The pond contains a boat launch and over 100 camps. The proposed project will be co-located in the existing transmission corridor that parallels the western side of Moxie Pond before crossing the southern end of the pond. The existing corridor will be widened by 75 feet to accommodate the proposed transmission line. The majority of new transmission structures adjacent to the pond will be screened by existing vegetation and will not be visible from the pond; however, the tops of approximately 12 structures will be visible from various areas of the pond. The widened corridor will be visible from two locations; the existing corridor is visible from these same locations today.

The VIA concludes the presence of the existing transmission line and the screening effects of shoreline vegetation result in the project having a minimal visual impact on the lake. (Minimal)

- B. Mosquito Mountain – Mosquito Mountain is located on private land but used informally by the public for hiking. The widened corridor and numerous structures would be visible from the mountain, adjacent to the existing transmission line that is presently visible. The VIA concludes that in the context of the existing transmission line and existing roads seen from the mountain the visual impact of the proposed line would be minimal. (Minimal)
- C. Troutdale Road – This private road is used to access camps on Moxie Pond, as well as several other roads in the Town of Moscow. The road runs parallel to, and within the cleared corridor of, the existing transmission line. The VIA states the project structures and widened corridor would be visible from the road. The longest duration of exposure would be for approximately 1,000 feet where the road is located within the eastern side of the existing cleared corridor. Due to the project being co-located with the existing corridor the VIA concludes the impact on motorists' continued use and enjoyment of the Troutdale Road, and other private roads in the area where there would be less exposure to the project than along the Troutdale Road, would be minimal. (Minimal)
- D. Appalachian Trail (AT) – Approximately 14.5 miles of the AT is located within five miles of Segment 2. The proposed Segment 2 transmission line would be co-located with an existing 115-kV transmission line. The applicant evaluated the visual impact on AT hikers from three general areas: Pleasant Pond Mountain summit area, Troutdale Road area, and Bald Mountain summit area. Within these three general areas a total of 11 viewpoints were reviewed (including from Middle Mountain). From Pleasant Pond Mountain the VIA concluded there would be minimal visual impact due to the viewing distance and the resulting minimal project visibility. From the areas near Troutdale Road, including where the AT runs along the road, the VIA concludes that the visual impact from the AT would

be minimal to moderate due to the presence of the existing transmission line corridor. The applicant proposes to plant a buffer along Troutdale Road to minimize the visual impact of the corridor. From the Bald Mountain summit area, the VIA concludes there would be minimal visual impact due to the partial screening and viewing distance. (Minimal/Moderate)

- E. Wyman Lake Recreation Area – This area is located in Pleasant Ridge Plantation and managed by Brookfield Renewables and the Bingham-Moscow Chamber of Commerce. The project will be visible from the recreation area and from Wyman Lake, but will be located near the existing Wyman Hydroelectric Dam, which impounds Wyman Lake and also is visible from the lake and recreation area. (Minimal)

Segment 3

- A. Road Crossings – Segment 3 will cross several State roads, including Route 2 in Farmington, Route 8 in Anson and Route 201 in Moscow. A total of 64 road crossings are proposed in this segment. At 39 of these crossings, motorists currently see an existing 115-kV transmission line. At the remaining 25 crossings, motorists currently see two 115-kV transmission lines. The widened corridor and structures would be visible at the crossings. The VIA states the project will result in a minimal increase in overall visual impact. (Minimal)
- B. Androscoggin Riverlands State Park – This 2,675-acre State Park includes 12 miles of Androscoggin River frontage. The park provides river access for boating and numerous all-season trails. The existing corridor crosses a portion of the park, and the widened corridor and new structures would be visible to park visitors from land. The corridor would not be visible from the river. (Moderate)
- C. Merrill Road – The existing corridor crosses Merrill Road in Lewiston. The proposed new Merrill Road Converter Substation would be located approximately 2,400 feet north of the road and would not be visible from the road where the corridor crosses it. There are no scenic resources with potential views of the converter station. (Moderate)

Segment 4

- A. Riverside Drive – The rebuilt line crosses Riverside Drive and then the Androscoggin River in Auburn. The existing 45-foot high H-frame structures would be replaced by 75-foot high single pole supports. (Minimal)
- B. Fickett Point Substation – The applicant proposes to construct a new 345-kV STATCOM substation in Pownal. The substation would be located on a 4-acre parcel, approximately 60 feet from Allen Road and 115 feet or more from Fickett Road. The substation would be visible to motorists and several homes on the

north side of Fickett Road. The applicant proposed to plant a vegetative, visual buffer along the south side of Fickett Road. (Moderate)

Segment 5

- A. Route 27 – The new transmission line would be located between two existing lines, within the current corridor. The new structures and conductors would be visible as the line crosses Route 27 in Wiscasset. No new corridor clearing is proposed. (Minimal)
- B. Route 194 – The new transmission line would be located between two existing lines, within the current corridor.

The new structures and conductors would be visible as the line crosses Route 194 in Whitefield. No new corridor clearing is proposed. (Minimal)

Additionally, the applicant analyzed potential impacts for the following sites and determined there would be limited impact (typically minimal or no impact), or determined there is no reasonable public access to the site:

Segment 1

- No. 5 Bog
- Snowmobile Trails, ITS 89 and ITS 87
- Moose River
- South Branch Moose River
- Iron Pond
- Egg Pond
- Grace Pond, Upper Enchanted Parcel

Segment 2

- Arnold Trail Historic District
- Snowmobile Trail, ITS 86
- Moxie Mountain
- Baker Stream

Segment 3

- Monument Hill
- Clearwater Pond
- Dead River
- Allen Pond
- Berry Pond
- Sterry Hill
- Nutting
- Snowmobile Trails, ITS 82, 84, 87, and 115
- Kennebec Valley Trail
- Mount David

Segment 4

- No Name Pond
- Androscoggin River
- Randall Road Ballfields
- Snowmobile Trails, ITS 87 and 115

Segment 5

- Montsweag Dam Preserve
- Residential structures

The VIA also included proposed mitigation strategies, including the use of self-weathering single steel poles to minimize visual contrast, particularly in Segment 1 where structures would often be seen against a wooded backdrop.

Co-location in Segments 2 and 3 also was noted as minimizing new clearing. Mitigation strategies at substations described in the VIA included limiting additional clearing and development of buffer plans. Through the course of the Department's review of the application, additional mitigation measures were incorporated into the overall VIA, including vegetation tapering at Coburn Mountain and Rock Pond, non-specular conductors at Rock Pond, Coburn Mountain, and Moxie Stream, and plantings at several locations, such as Route 201 crossings.

Finally, on May 1, 2019, the applicant submitted supplemental testimony in response to the Department's request in the Tenth Procedural Order. In this supplemental filing the applicant evaluated both whether taller poles within Segment 1 would be visible and their potential visual effect. The focus of this evaluation was the area surrounding the nine priority areas for habitat connectivity identified by TNC through pre-filed witness testimony.¹⁶ In the vicinity of these nine areas the applicant identified resources with potential views, identified whether taller poles with a height of 130 feet would be visible from the resource, and discussed the nature of any impact.

The applicant states that its VIA demonstrates that the project meets the standards for scenic character in both Site Law and NRPA.

B. Peer Review Comments and Applicant Response

The Department hired James F. Palmer of Scenic Quality Consultants (SQC) to provide comments to the Department on the portions of the application related to scenic character. SQC reviewed the VIA included by the applicant in its initial submission and provided the Department with comments dated August 20, 2018. SQC also visited several of the project photosimulation locations on September 5, 2018. The Department reviewed and considered SQC's August 20 comments, as well as subsequent comments provided by

¹⁶ The purpose of the taller poles would be to allow taller vegetation to grow within the corridor under the conductors, improving wildlife connectivity. Wildlife impacts, including the benefits of taller vegetation within the corridor, is discussed in Section 7.

SQC dated November 23, 2018.¹⁷ SQC's comments presented a number of questions, including about the viewshed analysis, whether scenic resources were appropriately identified, and the process for selecting key observation points for which photosimulations were produced. These questions all related to the overall value of the applicant's VIA in assessing potential visual impacts of the project.

Following consideration of each set of comments from SQC, the Department asked the applicant for clarification or for additional information the Department determined was needed to further its review of the project's visual impacts. The applicant provided responses to Department information requests on October 19, 2018 and December 7, 2018.¹⁸ Both responses contained sections focused on assessment of visual impacts, including responses to the questions posed by the Department and comments prepared by SQC. Through this process the applicant significantly supplemented its VIA.

In addition to providing comments on the applicant's VIA, SQC also reviewed and commented on an Upper Kennebec River rafting experience survey commissioned by the applicant. The survey, which involved individuals rafting on the Upper Kennebec and Dead Rivers in the fall of 2018, was completed in response to comments SQC offered at the time the applicant was proposing an overhead crossing of the Upper Kennebec River. The survey was designed to help assess the impact an overhead crossing would have on rafters. SQC offered its interpretation of the survey results – that rafters would notice degraded scenery from an overhead crossing, but would still enjoy the rafting trip and likely return for a repeat rafting experience. SQC also commented that the survey may have value when assessing the visual impacts at other locations, particularly for people engaged in water-based activities, and saw the survey as indicating that people believe seeing power lines has a greater negative impact on the river recreation experience than most other human activities, including wind turbines, clear cuts, and bridges. The applicant responded to SQC's comments, explaining why it believed SQC overstated the relative visual impact of transmission lines relative to other types of human activity or development.

C. Public Hearing Evidence and Written Comments

(1) Applicant Testimony

During the applicant's testimony, Terrence DeWan and Amy Segal, from Terrence J. DeWan & Associates, explained their methodology for the creation of the VIA. In their testimony they stated that they evaluated scenic impacts within three miles of the corridor, which is standard procedure.

¹⁷ The August 20 and November 23, 2018 comments noted here were the most lengthy and substantive comments offered by SQC. SQC provided additional comments, including on the Merrill Strip Alternative and the Winter Recreation Survey conducted by Sandra Howard, PhD, as well as on potential wildlife impact mitigation strategies in April 23, 2019 comments.

¹⁸ On December 9, 2018, the applicant submitted revised Attachments E and F to its December 7, 2018 response to the Department's additional information request. Both attachments relate to the assessment of visual impacts. Reference in this Order to the applicant's December 7 submission includes the December 9 revisions.

In addition, they also evaluated impacts beyond that, out to five miles from the corridor, for scenic resources as defined in Chapter 315. DeWan and Segal provided testimony on methods used to avoid, minimize, and mitigate the impacts to the numerous affected scenic resources. Some of these methods include: avoiding ridge lines; planting visual buffers in the corridor along the Old Canada Road (Route 201); using non-specular conductors to avoid reflecting sunlight; tapering vegetation around Rock Pond and the areas visible from Coburn Mountain to minimize the line contrast between the corridor and the surrounding forest; and using self-weathering steel poles to maximize landscape compatibility.

DeWan and Segal testified that in their professional opinion, the project would not have an unreasonable adverse effect on the scenic character of the area and would fit harmoniously into the environment. The applicant also testified that the proposed compensation plan adequately compensates for any unavoidable impacts to recreational use of all the scenic resources impacted by the project.

(2) Intervenor Testimony

Group 1 argues that the impact to the Old Canada Road Scenic Byway extends beyond what is visible from the road. In testimony, Robert Hayes argues that travelers coming to the byway come for the entire experience, not just for driving. In his view, the purpose of the byway is to promote tourism in the area and part of that promotion is the scenic beauty of the Upper Kennebec and Moose River valleys, as well as Coburn Mountain. He contends that the project will diminish the proud character of the area resulting in decreased tourism and traditional economic activity.

Groups 2 & 10 argue that the applicant's VIA is inadequate, pointing to comments of SQC in its review memos pertaining to the project. They also contend that the applicant should have conducted user surveys of snowmobilers utilizing the trails in and around the project area near The Forks and argue that this omission is a fatal flaw in the application. Groups 2 & 10 witnesses testified that the project would have a serious impact on the recreational use of the area because many of their clients would no longer come to the area due to the negative scenic impact of the transmission line.

A witness for Group 3, Robert Meyers, the Executive Director of the Maine Snowmobile Association, testified that the snowmobile clubs that make up the association have many miles of trails located in power line corridors. He further testified that he has never received a complaint from a snowmobiler about viewing transmission lines.

A Group 4 witness, Dr. David Publicover, testified that the applicant had not adequately buffered the new transmission line from views that would be experienced by users of the AT. He suggested that this could be accomplished by relocating the trail and recommended that this be a condition of approval if the proposed project is approved.

Group 7 witnesses testified that the applicant's proposal to run the proposed transmission line under the Upper Kennebec River addressed the most significant scenic impact and

that based on their familiarity with the character of the area of the proposed corridor, experience in the outdoor recreation industry, and other steps the applicant took to site the project to minimize visual impacts, the project will not have an adverse impact on existing scenic, aesthetic, and recreational uses of the area surrounding the project.

(3) Public Testimony and Written Public Comments

Many of the written and oral comments the Department received from members of the public related to the scenic impact of the project, particularly from Segment 1.

A large majority of the comments in opposition to the project contained statements that the scenic impacts of the proposed project would be unreasonable. Often these comments were general in nature without focusing on potential impacts at specific locations. When reference was made to specific locations, the impacts to views from Coburn Mountain and the Old Canada Road were commonly noted. Many of the comments received by the Department in support of the project that mention scenic impacts state that the scenic impacts are outweighed by the benefits of the project in terms of a reduction in greenhouse gas emissions.

D. Department Analysis and Findings

(1) Regulatory Framework

Site Law, 38 M.R.S. § 484(3), and NRPA, 38 M.R.S. § 480-D(1), both have standards pertaining to scenic impacts that must be satisfied in order to obtain a permit from the Department. Site Law prohibits development that will “adversely affect” scenic character, while NRPA prohibits activity that will “unreasonably interfere” with existing scenic and aesthetic uses. The criteria of the two laws reflect a similar intent in that they both allow development or activity that will result in a visual impact, but when this impact is too great an applicant fails to satisfy the review criteria. This is reflected in the corresponding NRPA and Site Law rules, both of which specify that the applicant’s burden is to demonstrate that there would be no “unreasonable adverse” impacts or effects and the Department’s assessment is on that basis. Ch. 315, §§ 1 & 4 and Ch. 375, § 14(B) & (C).

When reviewing scenic impacts under NRPA and evaluating whether an impact is unreasonable, the Department is guided in part by Chapter 315, § 9. This section provides:

The Department’s determination of impact is based on the following visual elements of the landscape:

- A. Landscape compatibility, which is a function of the sub-elements of color, form, line, and texture. Compatibility is determined by whether the proposed activity differs significantly from its existing surroundings and the context from which they are viewed such that it becomes an

unreasonable adverse impact on the visual quality of a protected natural resource as viewed from a scenic resource;

- B. Scale contrast, which is determined by the size and scope of the proposed activity given its specific location within the viewshed of a scenic resource; and
- C. Spatial dominance, which is the degree to which an activity dominates the whole landscape composition or dominates landform, water, or sky backdrop as viewed from a scenic resource.

In making a determination within the context of this rule, the Department considers the type, area, and intransience of an activity related to a scenic resource that will be affected by the activity, the significance of the scenic resource, and the degree to which the use or viewer expectations of a scenic resource will be altered, including alteration beyond the physical boundaries of the activity. In addition to the scenic resource, the Department also considers the functions and values of the protected natural resource, any proposed mitigation, practicable alternatives to the proposed activity that will have less visual impact, and cumulative effects of frequent minor alterations on the scenic resource. An application may be denied if the activity will have an unreasonable impact on the visual quality of protected natural resources as viewed from a scenic resource even if the activity has no practicable alternative and the applicant has minimized the proposed alteration and its impacts as much as possible through mitigation. An “unreasonable impact” means that the standards of the NRPA, 38 M.R.S. § 480-D, will not be met.

Site Law similarly requires the Department to evaluate whether a scenic impact is unreasonable. The corresponding Site Law rules instruct the Department to consider all relevant evidence as part of its evaluation, including evidence on whether:

- A. The design of the proposed development takes into account the scenic character of the surrounding area;
- B. A development which is not in keeping with the surrounding scenic character will be located, designed, and landscaped to minimize its visual impact to the fullest extent possible;
- C. Structures will be designed and landscaped to minimize their visual impact on the surrounding area;
- D. The plans for the proposed development provide for the preservation of existing elements of the development site which contribute to the maintenance of scenic character.

The Site Law rules do not contain a section similar to NRPA's Chapter 315, § 9, which identifies more specific elements to be considered that guide the Department in determining whether a scenic impact is unreasonable. Finding the guiding concepts in Chapter 315, § 9 instructive to the Department's charge under Site Law in evaluating visual impacts, the Department considers the same elements for evaluating visual impacts set out in Chapter 315, § 9 when evaluating the same type of impacts under Site Law.¹⁹ As noted above, while similar, NRPA and Site Law are not identical. The Department's evaluation of visual impacts under NRPA focuses on impacts to existing scenic uses. As specifically set forth in Chapter 315, scenic impacts under NRPA are evaluated from those public resources and public lands used by the public, defined as "scenic resources." Ch. 315, §§ 5(H) and 10.

The Department's review of visual impacts under Site Law is broader. Under Site Law the Department must consider whether the applicant has made adequate provision for fitting the proposed project harmoniously into the natural environment and whether the proposed project would adversely affect scenic character in the municipality or in neighboring municipalities. As a result, in reviewing the project the Department evaluated potential visual impacts from locations fitting the NRPA definition of scenic resources, as well as from other areas where the project would be visible to the public, including from privately owned land. Through evaluating the project from these many vantage points, the Department is able to evaluate the project as a whole and assess both whether the project unreasonably impacts existing scenic uses and whether it adversely affects scenic character of the area. For the purpose of this Order, where the Department finds the project will not have an unreasonable adverse effect on scenic uses or character it finds the scenic impact standards in both NRPA and Site Law, where applicable, are satisfied.

(2) Sufficiency of the VIA

The burden rests with the applicant to demonstrate that its proposal satisfies the visual impact standards under Site Law and NRPA. The applicant's VIA is an important component of its application with respect to visual impacts. Along with the original VIA, supplemental information provided in response to questions and comments on the original VIA, including from the Department and the consultant it retained, became part of the overall VIA. The Department evaluated the sufficiency of the overall VIA, guided by Chapter 315, § 7 and Chapter 375, § 14(C), which address the components of VIAs.

The applicant selected an Area of Potential Effects (APE) of three miles, extending to five miles from elevated viewpoints. As explained in the VIA, the project would be considered to be in the foreground when within 0 to 0.5 miles from the observer, in the midground at a distance of 0.5 to three miles, and in the background at a distance of greater than three miles.

¹⁹ When applying this general framework as part of its Site Law review, the Department does so without focusing on scenic resources as specifically defined in Chapter 315. The general framework includes consideration of the elements of landscape compatibility, scale contrast, and spatial dominance when evaluating visual impacts, as well as consideration of context, such as the type of area, significance of the area, and viewer expectations.

At distances greater than three miles, changes to the landscape are highly visible only if they present noticeable contrast in form or line. While poles could be visible to some observers when in the background, the corridor itself, depending on the angle of the observer relative to the corridor, is more likely to be noticeable. The APE is tailored accordingly, extending to three miles everywhere and to five miles where viewpoints are elevated, making the ability to see poles or wires in the background more likely and identification of the corridor, which typically will have trees on both sides, particularly along Segment 1, easier. This approach is the APE the Department – informed by decades of experience applying Site Law and NRPA – typically requires for large-scale projects such as the present one.

In its comments, SQC observed that the APE distances for the transmission wires and poles are in general agreement with the literature, but expressed uncertainty about whether those distances were sufficient to evaluate the visual impact of the corridor. It was not clear to SQC at the time of initial comments to what extent the applicant had considered visibility of the corridor (as opposed to just the structures in it) when selecting the APE. In its October 19, 2018 response to a Department information request, the applicant explained where and how corridor visibility had been considered and accounted for in photosimulations. Also, additional photosimulations were provided on December 7, 2018 and January 9, 2019, showing the corridor in the winter, when most visible, from Coburn Mountain and elsewhere. This responsive material and accompanying photosimulations allowed evaluation of the APE with respect to the corridor. Based on the evidence in the record, the Department finds the APE is appropriately sized for the size, scope, and nature of the project, recognizing its location, including the location of Segment 1 in a primarily forested, largely undeveloped area.

Within the APE, identifying locations from which the project would be visible and then assessing the visual impact from key locations is a central component of the VIA. SQC's comments and the applicant's responses assist with review of the sufficiency of the VIA in this area. SQC expressed uncertainty about whether the VIA evaluated impacts from the appropriate places. SQC posed questions about the applicant's viewshed analysis, identification of scenic resources, and selection of key observation points – the points for which photosimulations were created.

The applicant's viewshed analysis includes one analysis based on topography only and another analysis assuming the presence of vegetation, structures, and other obstructions. SQC questioned the data used to reflect forested conditions in the second (landcover) viewshed analysis. While SQC stated the forest cover height of 40 feet used by the applicant was consistent with professional practice, SQC pointed to different and more recent data reflecting the location of forest cover that could have been used. SQC acknowledged, however, that the precision of the viewshed analysis in and of itself was not particularly significant. The significance of the viewshed analysis was dependent on how it was used. SQC believed the landcover viewshed analysis was central to the applicant's identification of locations within the APE from which to evaluate the scenic impacts of the project. Reliance on the viewshed analysis, for example, could mean a place could incorrectly be assumed to be screened from the project. SQC pointed to the

fact that roughly half of the key observation points selected by the applicant for photosimulations, because the project would be visible from those points, are not points identified on the landcover viewshed map. SQC stated that this reflected the limited value of the viewshed analysis.

The Department concurs with SQC on its observations about how the viewshed analysis was used as part of the VIA and notes that the relative role of the viewshed analysis in the overall identification of key observation points could have been more thorough in the original VIA. However, the explanation provided by the applicant in its December 7, 2018 response adds important clarity.

The applicant noted that the landcover viewshed analysis was just a starting point and that for Segments 1 and 2, recognizing forestry patterns change, a topographic viewshed analysis also was used. Vegetation was not included in this analysis. Additionally, the viewshed analysis (both landcover and topographic) was supplemented by Google Earth aerial imagery for 2016 to determine where harvesting operations may have recently altered visibility. The applicant explained that while field investigations started with locations where it appeared there would be views of the project, its consultants collected GIS data, conducted on-line research to identify scenic resources, reviewed aerial imagery, and field checked viewshed maps. The table listing scenic resources submitted by the applicant shows the extensive field work done by the applicant, including site visits to locations where viewshed mapping suggested no visibility. The Department finds SQC's comments helpful and informative; they identified the limitations of the landcover viewshed analysis completed by the applicant. The Department also finds the applicant recognized the value and limitations of the landcover viewshed analysis and appropriately used the analysis, in conjunction with field work and other tools and analysis, as part of the overall VIA. This is supported by the fact that the applicant appropriately identified many KOPs outside the landcover viewshed.

NRPA requires evaluation of visual impacts from scenic resources. While the term scenic resource is defined in Chapter 315, § 5(H), in its review of the applicant's VIA, SQC questioned whether the applicant may have failed to identify scenic resources within the APE. For example, in its August 20, 2018, comments SQC wondered whether all public roads, cemeteries, and land included in Maine's Open Space Tax Law program qualify as scenic resources. The Department notes that privately owned lands, by virtue of inclusion in the Open Space tax program, are not converted to "public natural resources" or "public lands." However, certain cemeteries (those on public land) and public roads (those with notable scenic views) are scenic resources. In its December 7, 2018 submission, the applicant expanded its analysis to include these resources and provided a comprehensive list of all identified scenic resources in its Attachment F, Scenic Resources Chart.²⁰ The Department finds the applicant identified the scenic resources within the APE, consistent with the Department's expectations for a VIA as laid out in Chapter 315, § 7.

²⁰ The applicant continued to update this chart, for example, submitting an updated Attachment F on January 30, 2019.

The applicant selected KOPs and prepared photosimulations from these points to illustrate what observers see from these vantage points presently and what they would see if the project were constructed. These points reflect worst-case scenarios and, by including KOPs across the entire project, also reflect the project as a whole. The initial VIA included photosimulations from 32 KOPs. Through the course of review, 21 additional photosimulations were added²¹, including:

- One photosimulation depicting the tapered vegetation proposed at Rock Pond, and
- Thirteen photosimulations at ten locations showing snow cover conditions.

While the initial submissions by the applicant on this issue were lacking in thoroughness, the submission of additional information in response to questions and comments is not unusual during project review. The Department finds the resulting package of photosimulations is robust and allows full evaluation of the project, including transmission structures and wires, the corridor, and substation, and under various conditions (including snow cover and leaf-off). The Department recognizes the project has drawn considerable public attention and generated extensive comment from intervenors and the public, including from individuals who live and recreate in the area of the project. Much of the evidence presented by intervenors and testimony and written comments submitted by members of the public has addressed the potential visual impacts from various locations. Particular areas of focus in the evidence are the Upper Kennebec River crossing, Coburn Mountain, Rock Pond, several areas along the Spencer Road, the Appalachian Trail, Old Canada Road (Route 201), and Beattie Pond. These are among the places focused on by the applicant in the VIA.

In addition to the identification of scenic resources and KOPs, and the development of photosimulations, the overall VIA describes the significance of visual impacts from various locations, addresses uses of the area and viewers' expectation, and discusses proposed measures to avoid and minimize impacts to scenic resources, including: use of self-weathering poles, co-location of segments with existing transmission line corridor, tapering in certain areas, reducing pole heights in certain areas, and planting buffer vegetation in select areas to minimize impacts looking up a corridor and at the Fickett Road substation. The applicant's supplemental testimony also addresses the potential visibility of and associated visual impact of taller poles in certain areas along Segment 1. The Department finds the VIA, with the supplementary evidence submitted, was developed in a manner consistent with Chapter 315, § 7 and Chapter 375, § 14(C) and is sufficient to enable evaluation of whether the project satisfies the visual impact standards in NRPA, 38 M.R.S. § 480-D(1), and Site Law, 38 M.R.S. § 484(3).

²¹ During the course of the Department's review of the project, the applicant submitted photosimulations that supplemented its initial VIA and were for alternatives that are not part of the final proposal, including four photosimulations for the Brookfield Alternative and four photosimulations for a three-structure design for an overhead crossing of the Upper Kennebec River.

(3) Evaluation of Scenic Impacts

In evaluating the scenic impacts of the proposed project under Site Law, 38 M.R.S. § 484(3), and NRPA, 38 M.R.S. § 480-D(1), the Department considered all relevant evidence in the record, including the application and supplementary filings by the applicant, information gathered during the public hearing, the written comments received, the comments of the independent scenic consultant, and the evidence gathered directly by Department staff. The Department staff visited the project area several times in 2018. In addition, on June 29, 2019, the Commissioner, Presiding Officer, Assistant Attorney General, and Department staff conducted a site visit.

The Department evaluated the scenic impact of the project as a whole, as well as from specific vantage points along the length of the project.

This evaluation includes consideration of the potential visual impact of taller poles, transmission structures with a height of 130 feet, within Wildlife Areas identified in Appendix C and required by this Order as explained in Section 7. As SQC commented with regard to taller poles, recreators in the forest will not have views of taller poles and will not encounter a cleared corridor. The taller poles are intended to allow the growth of vegetation within the corridor. Potential visual impacts of taller poles would occur in two situations, open waters and rivers associated with wetlands and elevated viewpoints.

The following discussion and analysis focus on the key locations and topics identified by the Department, its consultant, the applicant, the intervenors, and members of the public during the course of the Department's review.

a. Upper Kennebec River Crossing

The section of the Upper Kennebec River where the applicant originally proposed an overhead crossing is nationally known for its whitewater rafting with approximately 40,000 people a year booking trips with local rafting companies to float this section of the river. Initially, the applicant proposed an overhead crossing utilizing a five-structure design. The conductors, shield wires and the tops of at least two structures would have been visible from the Kennebec River. The applicant redesigned the crossing to eliminate two of the structures in an attempt to reduce the visibility of the project from the river. After the early portions of its review, and review of public input submitted to that point, on May 7, 2018, the Department sent the applicant a letter expressing its concerns with an overhead crossing of the Kennebec River and the scenic impact it would have on existing recreational use of the area. It is unlikely the Department could have found an overhead crossing in this area satisfied the scenic impact standards in NRPA and Site Law.

In October 2018, the applicant amended its application and proposed to utilize a HDD to install the transmission line under the river. With this design, none of the project elements will be visible from the river, although some area of reduced vegetation may be visible from the river.

Based on the change from an overhead crossing to a HDD crossing with no project visibility from the Upper Kennebec River, the Department finds that the proposed project will not have an unreasonable adverse effect on scenic uses or character of the Upper Kennebec River.

b. Spencer Road, Hardscrabble Road, and Other Logging Roads Near Segment 1

These roads, located on private land, were constructed and are maintained to support the commercial forestry operations in the area. It is not uncommon for an individual traveling these roads to see evidence of recently harvested areas or logging equipment, as well as scenic vistas. There even may be areas where a harvest opens up a scenic view from the logging road that was not there prior to commercial forestry operations. Although a person may travel a private land management road and enjoy the surrounding scenic qualities or even travel such a road specifically for the scenery, private roads do not qualify as scenic resources under NRPA. They are neither a public natural resource nor public land.

Under Site Law, scenic impacts to the public from private property may be considered. With regard to land management roads, Maine has a long tradition of private timberland owners allowing members of the public, by permission, to access their timberland for recreational purposes, as well as to reach points more conveniently accessed by travelling private logging roads. The granting of this permission to access and travel across private property does not establish an expectation that any such traveler will enjoy a particular view. Reasonable viewer expectations are a factor considered by the Department when applying the scenic standards in Site Law and untouched forest is not a reasonable expectation when traveling roads used for forest management and harvesting. Some views of a transmission line with low-growth or tapered vegetation would not be sharply out of character along a land management road. The Department declines to interpret the concept of reasonable viewer expectations under the Site Law as including an expectation of certain scenic character when traveling on a private road across private property, by permission. There is no indication that the Legislature intended the Site Law to have that result, which could have a chilling effect on the long tradition of public access to private land in Maine. The Department finds the project will not have an unreasonable adverse effect on scenic uses or character of the Spencer Road, Hardscrabble Road, or the other impacted private land management roads, including as a result of the installation of taller poles in the Wildlife Areas identified in Appendix C.

c. Coburn Mountain

The initial VIA contained only photosimulations with leaf on conditions. On September 4, 2018, the Department requested additional information, including photosimulations depicting the project when snow covered the ground. In response to this request, on October 19, 2018, the applicant submitted photographs taken by an unknown person in 2004 from the top of Coburn Mountain. The Department, in a November 5, 2018 letter, again requested the applicant produce photosimulations with snow cover conditions and

stated that the October 19, 2018 submission was not satisfactory. On December 7, 2018, the applicant submitted the requested photosimulations, including simulations from the top of Coburn Mountain. The Department finds that the snow-cover photosimulations from the top of Coburn Mountain depict the project as a highly visible cleared area that is not compatible with the existing landscape because the cleared, snow-covered corridor differed significantly from the existing surroundings, and the cleared, snow-covered corridor becomes the dominant landform due to the contrast between it and the primarily forested areas surrounding it.

To mitigate this impact, on January 9, 2019, the applicant proposed to taper the vegetation in the corridor for an approximately 2.2-mile section of corridor that is visible from Coburn Mountain.

Instead of clearing the full width of the 150-foot wide corridor, tapering retains increasingly taller vegetation within the corridor as the distance from the wire zone increases. Under the proposed tapering, the wire zone – the 54-foot wide, middle section of the corridor centered under the two conductors – would be cleared during construction and allowed to regrow with noncapable vegetation up to a height of approximately 10 feet, but immediately outside the wire zone, vegetation up to 15 feet tall would be maintained, with vegetation height increasing to 35 feet at the edges of the corridor. (Appendix C contains a further description of tapering.) Within this same section of the corridor the applicant also proposed to use non-specular conductors.

The Department received numerous comments from the parties, as well as interested persons, concerning scenic impact, generally, and from the summit of Coburn Mountain, specifically. Intervenor Groups 1, 2, and 10 all testified that the scenic impact from the top of Coburn Mountain in general, and particularly the impact to snowmobilers' use and enjoyment of Coburn Mountain, would be adversely impacted by the project. These groups provided testimony regarding the amount and value of the recreational use of Coburn Mountain, especially for the snowmobiling community. Intervenor Group 2 witness Greg Caruso testified that the adverse scenic impacts to views from the trails around Coburn and Johnson Mountains would severely affect his snowmobiling business. He described this area as the "mecca" of snowmobiling in Maine. Others provided similar testimony. It is not clear whether those offering testimony on the visual impact of the corridor from Coburn Mountain considered how tapering would affect this impact.

Intervenor Group 3 witness Robert Meyers, the Executive Director of the Maine Snowmobile Association, testified that the project would not adversely affect snowmobilers' enjoyment of the area. Meyers stated that many of the existing snowmobile trails in Maine are located along transmission lines and that he has never heard a complaint from the members of his organization about having a view of a power line.

The Department finds compelling the evidence that the project, as originally proposed, would have an adverse impact on the users of Coburn Mountain, particularly snowmobilers. The applicant's proposal to taper vegetation in the area visible from the summit, as well as to use non-specular conductors, significantly reduces the visual impact

of the project. Tapering softens the edge of the corridor and makes the corridor less visible overall. The addition of tapered vegetation reduces the spatial dominance of the project and improves its compatibility within the landscape. This is shown in the photosimulations with snow cover. A fully cleared, 150-foot wide corridor is the dominant feature in the landscape. The tapered corridor, in contrast, is no longer dominant, and is just one of the features of the landscape seen from the summit of Coburn Mountain, and no more prominent, for example, than an existing land management road.

Any taller poles needed to achieve the minimum required vegetation height in the Wildlife Areas identified in Appendix C would not be visible from Coburn Mountain.

The Department finds that the project will not have an unreasonable adverse effect on scenic uses or character of Coburn Mountain, provided the applicant:

- Tapers the vegetation in the corridor within the viewshed of Coburn Mountain (between structures #3006-634 and #3006-616), and
- Uses non-specular conductors within the viewshed of Coburn Mountain (between structures #3006-634 and #3006-616).

d. Number 5 Mountain, T5 R7 BKP WKR

Number 5 Mountain is owned by TNC and is located 3.9 miles from the project. TNC has developed a parking area, a large informational map, and a trail to the top of the mountain. TNC invites members of the public to hike the mountain. No. 5 Mountain is within the Leuthold Preserve, which is collaboratively managed by TNC, Forest Society of Maine, and the Maine Bureau of Parks and Lands. Access to the trailhead parking area for No. 5 Mountain is over the privately-owned Spencer Road, a land management road owned by a third party. The applicant identified the mountain as a scenic resource as a result of being part of the preserve.

The corridor and structures, located at a distance of 3.9 miles, will be visible from the summit of No. 5 Mountain. The project will have a moderate impact as a line zigzagging within the scenic view. However, since the structures will not be silhouetted against the sky backdrop, the project lines are not a significant object in the viewshed. Additionally, taller poles within Wildlife Area 2 would be eight miles from No. 5 Mountain and would not affect the view from the mountain due to this distance. The Department finds the overall scenic impact to be minimal; the project will not have an unreasonable adverse effect on scenic uses or character of No. 5 Mountain.

e. Beattie Pond

Beattie Pond is a remote pond developed with a single camp that is accessed by a private road. The applicant's original proposal included standard poles heights (approximately 100 feet tall) in the area near Beattie Pond. At the request of the Commission, one of these structures was redesigned to be shorter. As redesigned, the visibility of the project

from the pond would be limited to just the very top of that structure. On September 18, 2019, the applicant submitted a petition to reopen the record to allow it to modify the application to change the proposed route and use the Merrill Strip Alternative. As described in Section 1, this alternative moved the project out of the P-RR Subdistrict around Beattie Pond. Existing vegetation and topography would screen the project from view from most of the pond. Any project visibility would be minimal. Within Wildlife Area 1, taller poles may be needed to achieve the required minimum vegetation height. This Wildlife Area does not include the structures closest to Beattie Pond, which would be visible if increased to a height of 130 feet. Wildlife Area 1 is outside of the viewshed of Beattie Pond. Based on the applicant's proposal to use the Merrill Strip Alternative, the Department finds that the project will not have an unreasonable adverse effect on scenic uses or character of Beattie Pond.

f. Rock Pond

Rock Pond is a 124-acre pond with a boat launch and campsite. Project structures and the corridor would be visible approximately 3,100 feet away. The portion of the project that is most visible from Rock Pond is the area where the corridor is perpendicular to the view from the pond, when an individual is looking northwest and up the corridor. The applicant's revised plan incorporates tapering vegetation along this section of the corridor. This minimizes the visibility of the corridor, making it much less prominent and improving compatibility with the landscape. The applicant also proposes to use non-specular conductors in this area where the project is visible from the pond. This further reduces visual intrusion. The Department notes that in contrast to Coburn Mountain, the Department received very few comments from users of Rock Pond, or individuals concerned about the view from the pond. In addition, the Department staff, the Commissioner, Assistant Attorney General, and the Presiding Officer visited Rock Pond during their June 29, 2019 site visit. During that visit the existing conditions were compared with the photosimulations contained in the record.

The Wildlife Areas closest to Rock Pond are Wildlife Areas 3 and 4. The Department finds the applicant's supplemental testimony demonstrates taller poles in these areas will not be visible from Rock Pond. Wildlife Area 3 corresponds with TNC's priority area 3 and Wildlife Area 4 corresponds with a portion of TNC's priority area 4, but not the portion of this area that would be visible from the pond if taller poles were used.

Based on the applicant's VIA, evidence concerning potential impacts to uses of Rock Pond, and the site visit, the Department finds the project will not have an unreasonable adverse effect on scenic uses or character of Rock Pond, provided the applicant:

- Tapers the vegetation in the corridor within the viewshed of Rock Pond (between structures #3006-731 and #3006-729), and
- Uses non-specular conductors within the viewshed of Rock Pond (between structures #3006-731 and #3006-724).

g. Old Canada Road (Route 201)

The Old Canada Road Scenic Byway is a 78.2-mile long section of Route 201. People experience the byway when traveling by motor vehicle. The project is perpendicular to and intersects the Old Canada Road in Johnson Mountain Township. The project will introduce a moderately incompatible line to the landscape when it crosses Route 201. Due to a rise in the roadway, when traveling northwest the line will be silhouetted against the scenic backdrop. However, it appears as a small object and is insignificant in dominance. Motorists will see the project for a very short time as they drive by (approximately 30 seconds when traveling south and 60 seconds when traveling north), compared to the overall time it takes to travel the entire scenic byway, which is approximately 78 miles long. In Moscow, the crossing is not perpendicular to the road, it crosses at an angle, and it is co-located with another transmission line.

The existing corridor will be widened by 75 feet. From the roadway, the additional cleared corridor and several structures will be visible. The new structures are a moderate color difference from the surrounding landscape and the existing wooden transmission line poles. The new structures will introduce minimally incompatible lines to the landscape. Because this crossing is very close to the Wyman Dam and its associated electrical infrastructure, the view is not sharply out of character from other views in the vicinity. The applicant proposes to add buffer plantings at both crossings to minimize visibility down the corridor from the road.

The project will also be visible from two other areas along the byway; however, these views do not involve the corridor crossing the road. In Parlin Pond Township a field on the west side of the road will allow an intermittent view of the corridor for southbound motorists for approximately 15 seconds of travel time. As the photosimulations show, existing distribution lines running along Old Canada Road also may be visible in the foreground. Northbound motorists will not have a view of the project at that location, and the project will not be visible from the rest area in this township. The second viewpoint that is not a crossing is from the Attean View Rest Area in Jackman. While visible from the scenic viewpoint, the Department finds the scale of the structures will be minimal and the spatial dominance will be insignificant as the project will be more than seven miles away from this rest area.

None of the Wildlife Areas will be visible from Old Canada Road.

Based on the minimal time a motorist will have views of the corridor, the scale of the structures involved in comparison to the landscape, and the proposed buffer plantings, the Department finds the project will not have an unreasonable adverse effect on scenic uses or character of the Old Canada Road, provided the applicant:

- Plants and maintains vegetated roadside buffers at the Old Canada Road (Route 201) crossing in Johnson Mountain Twp and in Moscow.

h. Moxie Stream

The project, including the corridor, transmission lines and structures are discussed in the VIA and summarized above. The applicant proposes to use non-specular conductors to reduce the reflectiveness of the wires from the stream. In addition, the applicant originally proposed additional buffer plantings following the clearing for construction. However, the topography in the area enables retaining vegetation up to the height of 35 feet across the entire corridor within 100 feet of the stream. In response to Department questioning at the hearing, the applicant acknowledged this could be achieved without taller poles. This taller vegetation, required in this Order to minimize wildlife impacts, and identified as Wildlife Area 10, also would minimize the scenic impact and eliminate the need for the additional planting originally proposed by the applicant.

The Department finds the project will not have an unreasonable adverse effect on the scenic uses or character of Moxie Stream, provided the applicant:

- Maintains a minimum vegetation height of 35 feet within 100 feet of Moxie Stream (Appendix C lists the Wildlife Areas where taller vegetation is required, including at Moxie Stream), and
- Uses non-specular conductors within the viewshed of Moxie Stream (between structures #3006-542 and #3006-541).

i. Appalachian Trail

The applicant evaluated the scenic impacts of the project on the AT from three general areas: Pleasant Pond Mountain summit area (including Middle Mountain); Troutdale Road area, where the trail crosses the line in three locations; and the Bald Mountain summit area. Within these three general areas the applicant examined 11 viewpoints.

- AT, Pleasant Pond Mountain summit area, The Forks Plantation. The new transmission line will be visible from the mountain at a distance ranging from 2.7 to 6.5 miles. The project will create a minimally incompatible line in the background. The conductors may be more visible in the afternoon when sunlight reflects off the lines. This impact may be reduced through the use of non-specular conductors. The Department finds the visual impact will be minimal from the Pleasant Pond Mountain summit area due to viewing distance and the resulting minimal project visibility, provided the applicant uses non-specular conductors within the viewshed of the summit area, including Middle Mountain.
- AT, Troutdale Road area, Bald Mountain Township. The widened corridor and new structures will be clearly visible from the AT, which runs on Troutdale Road for 0.2 miles. Additionally, the corridor will be visible at a perpendicular angle to the trail where it crosses the southwest corner of Moxie Pond. The Department finds that, although the new structures and widened corridor will increase the scale of intrusion to the landscape, it is subordinate when considered with the existing road and transmission line (which affect the expectations of the users in

this area), provided the applicant plants and maintains the proposed buffer vegetation along Troutdale Road.

- AT, Bald Mountain summit area, Bald Mountain Township. At the point closest to the AT at this location, the co-located transmission line will be visible at a distance of 2.8 miles. The widened corridor will be visible at a distance of 5.1 miles. When viewed from the summit area, the widened corridor will create a moderately incompatible line within the context of the existing viewshed along the west side of Moxie Pond. Additionally, due to the height of the structures, the lines will be a moderately incompatible line in the midground. The conductors will be the most visible project component, especially in the morning when the sun reflects off of the lines. This impact can be minimized with non-specular conductors. On June 29, 2018, the applicant submitted revised plans proposing a lowered height for the structures along Moxie Pond, which will minimize the scenic impact from both Bald Mountain and Moxie Pond.

The Department finds the visual impact from the Bald Mountain summit area will be minimal due to the viewing distance, partial screening, and the resulting minimal project visibility, provided the applicant uses non-specular conductors within the viewshed of the summit area and shorter poles along Moxie Pond.

The Department finds the project will not have an unreasonable adverse effect on the scenic uses or character of the AT, provided the applicant:

- Uses non-specular conductors within the viewshed of the Appalachian Trail (between structures #3006-529 and #3006-458);
- Plants and maintains vegetated roadside buffers along Troutdale Road; and
- Uses shorter poles along Moxie Pond (between structure #3006-529 and #3006-458).

j. Other Scenic Resources and Vantage Points Along the Corridor

Other scenic resources and vantage points along the corridor evaluated by the Department include the following:

Segment 1

- Wing Pond, Lowelltown Township. Two structures and lines are visible approximately 1.75 miles from the pond. No clearing will be visible from the pond. The structures do not introduce any incompatible lines or shapes to the sky backdrop and are subordinate when seen against the backdrop of Smart Mountain.
- Fish Pond, Hobbstown Township. No corridor clearing will be visible from the pond. The structures do not introduce any incompatible lines or shapes to the sky backdrop and are largely obscured by existing vegetation.
- Northern Forest Canoe Trail, Hobbstown Township, T5 R7 BKP. Four structures may be visible to paddlers from Fish Pond and the line will be visible during a portage on Spencer Rips Road and Spencer Road.

As discussed above, the scenic impact on Fish Pond will be minimal. The structures do not introduce any incompatible lines or shapes to the sky backdrop and are largely obscured by existing vegetation. While portaging on both roads, there may be intermittent views of the project. The scenic impacts will be minimal to moderate.

- Parlin Pond, Parlin Pond Township. The project will have a moderate impact as an incompatible line crossing the shoulder of Coburn Mountain and continuing to the northwest. Additionally, one structure will appear as a silhouette line against the sky. Overall from this pond, the project will be compatible with the landscape given the viewing distance of 1.8 to 2.8 miles and only a single silhouetted pole will be visible.
- Iron Pond, T5 R6 BKP WKR, Hobbstown Township. The top of one structure will be visible, approximately 2,700 feet from the pond. This impact will be minimal.
- Toby Pond, Hobbstown Township. The pond is not a rated waterbody. With taller structures within Wildlife Area 5, two poles would be visible from the pond, with one of these silhouetted against the sky. This impact will be minimal.
- Whipple Pond/Whipple Brook, T5 R7 BKP WKR. As demonstrated in the applicant's supplemental testimony, no structures would be visible from Whipple Pond, including any taller structures within Wildlife Area 5. Where the corridor crosses Whipple Brook, the taller vegetation required in Wildlife Area 5 would screen the poles on either side of the brook and eliminate a view down the corridor. In front of the campsite located on Whipple Brook south of the corridor, a single taller pole might be visible. Overall, the visual impact of the project on Whipple Pond and Whipple Brook, including any taller poles within Wildlife Area 5, will be minimal.
- Egg Pond, Bradstreet Township. The top of one structure, located 332 feet from the pond, will be visible. Given the inaccessible nature of the pond, and the insignificance of the single structure in the overall viewshed, the scenic impacts from the project for this site are minimal.
- Little Wilson Hill Pond, Johnson Mountain Township. The top of two structures will be visible, approximately 1,300 feet from the pond. This impact will be minimal.
- South Branch Moose River, Skinner Township. In response to questions by Department staff at the public hearing, the applicant testified that due to the topography in this location, without changing pole heights, only vegetation taller than 35 feet will need to be cut along the river. Such a change from the proposed plan will reduce project visibility, resulting in a significantly mitigated, moderate visual impact. Even if taller poles were used as part of Wildlife Area 2, the taller vegetation would continue to help screen the taller poles by preventing a view down a cleared corridor.
- Cold Stream, Johnson Mountain Township. As a requirement of this Order, the applicant will be required to maintain 35-foot tall vegetation within 100 feet of this stream. This may require the installation of taller poles on both sides of Cold Stream. (See Wildlife Area 7 in Appendix C, Table C-1.) Poles and wires will be

visible from the stream regardless of final pole height. The taller vegetation will minimize visual impacts by buffering the view of the corridor from the stream.

Segment 2

- Moxie Pond, East Moxie Township. The co-located project lines and structures will be visible near the west side of the pond. The applicant modified the design of the project to reduce the height of the structures and lines so that the majority of the structures are screened from view from the pond. The redesigned project will not be silhouetted against the sky backdrop and the project is not a significant object in the viewshed. The Department finds the visual impact will be moderate.
- Mosquito Mountain, The Forks Plantation.²² The transmission line will be visible to the northeast and east when viewed from the scenic overlook. Some clearing for the widened corridor also will be visible. However, the transmission line will be partially screened by existing vegetation and is subordinate in the whole landscape composition.
- Troutdale Road, The Forks Plantation. The transmission line will be visible immediately adjacent to the existing line but will be only briefly visible to passing motorists. This road is a private land management road accessed by the public with permission, like Spencer Road discussed above. With the existing line there and user expectations, including forest management activities, the Department finds that this impact will not unreasonably impact the scenic character of the area.
- Wyman Lake Recreation Area, Pleasant Ridge Plantation. The Department finds that, although the proposed project is visible from the Recreation Area, with approximately four structures and conductors visible, it is subordinate in the landscape composition to the existing dam that impounds the lake and visible from other vantage points on the lake. The visual impact of the project on the recreation area is minimal.

Segment 3

- Route 8, Anson. The co-located transmission line will cross Route 8 in Anson. The new line will require an additional 75 feet of cleared corridor. From the roadway, the additional cleared corridor and several structures will be visible. The new structures will be a moderate color difference from the surrounding landscape as well as the existing wooden structures. The new structures will introduce minimally incompatible lines to the landscape.
- Route 2, Farmington. The co-located transmission line will cross Route 2 in Farmington. The new line will require an additional 75 feet of cleared corridor for a portion of the visible section, however, some of the area is already open fields. From the roadway, the additional cleared corridor and several structures will be visible.

²² Mosquito Mountain is privately owned and contains an informal hiking trail used by the public. The Department does not consider this elevated viewpoint to be a scenic resource as that term is defined in Chapter 315. Regardless, the project will not have an unreasonable adverse effect on scenic uses or character of Mosquito Mountain.

The new structures will be a moderate color difference from the surrounding landscape and the existing wooden structures. The new structures will introduce minimally incompatible lines to the landscape.

- Androscoggin Riverlands State Park, Leeds. The new co-located line will only be visible in the State Park as it crosses an access road in Leeds. The additional 75 feet of corridor clearing and the new structures will be visible for a considerable distance when viewed at the crossing due to the topography. Though there will be moderate contrast in material, color, and structure height, the visual impact to users of the park is expected to be minimal.
- Merrill Road, Lewiston. The additional 75 feet of corridor clearing and the new structures will increase the scale contrast to moderate, but the new transmission line is compatible with the existing landscape.
- Sandy River, Farmington. The corridor will be visible at a perpendicular angle to the River. The Department finds that although the new structures and widened corridor will increase the scale of intrusion to the landscape, it is codominant when considered with the existing transmission line.
- Carrabassett River, Anson. The new structures will be a moderate color difference from the surrounding landscape and the existing wooden structures. The Department finds that although the new structures and widened corridor will increase the scale of intrusion to the landscape, it is codominant when considered with the existing transmission line.

Segment 4

- Riverside Drive, Auburn. The new self-weathering steel structures will be a moderately different color from the landscape and existing structures. A total of six wooden poles will be replaced with two steel structures. The reduction in the number of man-made structures reduces the scenic impact and the new line will be compatible with the existing landscape.

Segment 5

- Route 194, Whitefield. The new transmission line will be located between two existing sets of structures. No new corridor clearing is proposed. The Department finds the new line is compatible with the existing landscape.
- Route 27, Wiscasset. The new transmission line will be located between two existing sets of structures. No new corridor clearing is proposed. The Department finds the new line is compatible with the existing landscape.
- Route 1, Wiscasset. The proposed project will add conductor lines to an existing lattice structure. The Department finds minimal to no visual impact from the additional lines.
- West Branch Sheepscot River, Windsor. The proposed corridor is located between two existing transmission lines. The Department finds minimal to no visual impact from the additional lines.

For each of these scenic resources and vantage points, the Department evaluated any photosimulations included in the VIA and the VIA as a whole, and considered the testimony and comments of its consultant, the applicant's testimony and supplementary

submissions, the testimony of the intervenors, and the testimony and written comments from members of the public. In addition, Department staff conducted site visits to many of the locations at issue and examined topographic maps of the areas. Based on this information and the record as a whole, the Department finds the five transmission line segments, including the poles, wires, and corridor, will not have an unreasonable adverse effect on scenic uses or character at any of the locations listed in this subsection.

k. Substations

The Department evaluated the scenic impacts of the substation upgrades that are part of the project.

- Merrill Road Converter Station. The proposed converter station will be approximately 85 feet or less in height. Existing vegetation with heights between 50 and 70 feet will remain as a visual buffer surrounding the station. Several residences are located within 600 feet of the proposed converter station but will have minimal views of the converter station due to the surrounding vegetation.
- Fickett Road Substation – Portions of the substation, including the access road and infrastructure, will be visible from Fickett Road, Allen Road, and three residences off Fickett Road. The applicant submitted a planting plan, dated August 9, 2018, with proposed plantings on both sides of the substation entrance on Fickett Road. The plantings range in heights at maturity from 4 to 70 feet and are intended to provide buffering to motorists and residents on Fickett Road. The substation will introduce a moderately incompatible form and moderately incompatible edges to the landscape; however, the proposed plantings will significantly mitigate these impacts.
- Coopers Mills Substation. Proposed additions to the north side of the Coopers Mills Substation include a new 345-kV transmission line terminal. No tree clearing is proposed. While three abutting residences and motorists on Coopers Mill Road will have some views of the project, the form, line, and texture will be compatible with the existing substation.
- Crowley's Substation. Replacement of a 115-kV switch and bus wire are proposed within the existing substation structure. No tree clearing is proposed.
- Larrabee Road Substation. Proposed upgrades to the existing substation include an additional 345-kV transmission line terminal and the replacement of an autotransformer. The upgrades will be visible from Mount David, a scenic hike on the Bates College campus, however, no significant changes in line, form, texture, or color will result from the project. An existing vegetative buffer will provide visual screening to a residence that abuts the substation.
- Maine Yankee Substation. An additional 345-kV transmission line terminal will be installed within the fenced yard of the existing substation, but it will be compatible with the existing character at this location.
- Surowiec Substation. A terminal for a new 345-kV transmission line from the proposed Fickett Road Substation, a new dead-end A-frame structure, and a new 345-kV circuit breaker will be installed at the existing substation.

No tree clearing is proposed and the additional structures will be similar in color, texture, and line to the existing substation.

- Raven Farm Substation. Proposed additions to the existing substation include a new 345/115-kV autotransformer and three new 115-kV transmission line terminations with associated equipment and foundations. An existing berm installed for the MPRP will provide visual screening for the project.

For each of the substation upgrades, the Department considered, along with all the record evidence, the surrounding area and its character, the nature and extent of the changes relative to the existing substation development, and the buffering and screening (both existing and proposed).

The Department finds the substation upgrades will not have an unreasonable adverse effect on scenic uses or character of the surrounding area, provided the applicant:

- Plants and maintains vegetated roadside buffers on the south side of Fickett Road in conjunction with the Fickett Road Substation.

1. Cumulative Impacts

Consistent with Chapter 315, § 9, the Department considered the cumulative effects of the project. These are effects that even if minimal or not adverse in any one instance could, in aggregate, unreasonably interfere with existing scenic and aesthetic uses. Given the length of the project, it will be visible from multiple viewpoints and multiple scenic resources. In evaluating cumulative effects under Chapter 315, the Department considered the frequency with which an observer might see the project from scenic resources, which is influenced by the distance and travel time between viewpoints.

Hikers along the AT and travelers along Old Canada Road (Route 201) are two groups with the potential to view the project from multiple points. Along the AT, the project will be visible from three general locations: Pleasant Pond Mountain, Troutdale Road, and Bald Mountain. The visibility of the project from these locations is discussed above. Hiking down from Pleasant Pond Mountain to Troutdale Road would take approximately three to three and a half hours, although hiking pace can vary considerably. Hiking up from Troutdale Road to Bald Mountain would take a similar amount of time. The Department finds that as a result of this separation, and the limited extent of the visual impact of the project at these locations (which takes into account the co-location of the line), there will not be an unreasonable cumulative interference with existing scenic or aesthetic uses of the AT.

With regard to Old Canada Road, the four locations from which the project will be visible are separated by the following distances: 6.2, 6.7, and 17.1 miles. While the travel time between viewpoints for a motorist on the road is short, so too is the amount of time for which the project would be visible at each point for someone traveling at the speed limit. (View times are discussed above.) In the context of the 78-mile stretch of road designated as a scenic byway, the cumulative time the project would be visible is

minimal. The Department finds that when the viewing time, distance between viewpoints, and scenic impact at each viewpoint are considered, the project will not result in an unreasonable cumulative interference with the existing scenic or aesthetic use of Old Canada Road.

The Department also considered that an observer could experience successive views of the project through travel that involved views from more than the AT or Old Canada Road alone. For example, by driving along Old Canada Road to Jackman and then snowmobiling to Coburn Mountain, an individual could engage in multiple activities where the project could be seen from different scenic resources.

In this example, the travel along the road and subsequent snowmobile travel are sufficiently distinct and separated by intervening activities, such as unloading snowmobiles and preparing for that activity, that any cumulative visual impact would be minimal. The Department finds that this example is representative and that even if an individual engages in multiple activities that included viewing the project from a scenic resource these views would be sufficiently distinct, separated by time, distance, and differences between the different activities that the cumulative effects of the project will not unreasonably interfere with existing scenic or aesthetic uses.

The cumulative impact of the project and other structures in its vicinity will also be not unreasonable. Pre-existing scenic impacts from land use activities in the Segment 1 area are almost entirely the result of commercial forestry. The cumulative impact of the project and these forestry activities, discussed in more detail in the following subsection, is not unreasonable. Outside of the Segment 1 area, the co-location of the project in an existing transmission line corridor will minimize its scenic impacts, and the cumulative impact of the pre-existing infrastructure and the project is likewise not unreasonable.

m. Forest Management Activities in the Vicinity of the Project

Portions of the project are proposed to be located in predominantly forested areas. Segment 1, in particular, would involve creation of a new corridor through a forested area in western Maine. Witness testimony and other record evidence establish the existing landscape in this broader area is a mosaic of various aged forests, ranging from mature forest to recently harvested areas. The mosaic changes over time as harvested areas mature and mature areas are harvested. It is important to emphasize that while remote, the area that Segment 1 would traverse is not untouched wilderness, but instead mostly consists of intensively managed commercial timberland.

As a general matter, the Department characterizes commercial timberland as forested, regardless of the age of the growth of the trees on the land at any given point in time. The reasonable expectation of an individual viewing timberland and the surrounding area, however, may vary depending on whether they are viewing a mature forest or a recently harvested area.

The Department is not able to predict which privately owned timberland in the vicinity of the project will be harvested and, if harvested, when a landowner may elect to do so. In evaluating the scenic impact of the project, the Department considered the likely possibility that commercial forestry activity will alter the landscape surrounding the project, particularly Segment 1. The Department considered elevated viewpoints and other viewpoints where existing vegetation could provide screening. From elevated viewpoints, such as Coburn Mountain, the corridor will remain a consistent feature compatible within the landscape as a result of the required tapering of the Segment 1 corridor.²³

The Department finds this is the case when the tapered corridor runs through a forested area and, as the visual simulations for Coburn Mountain show, when more recent forestry activity is visible, the prominence of a tapered corridor is even further reduced. In addition to the corridor, the poles and wires that are part of the project will have a visual impact. With a tapered corridor, vegetation adjacent to the transmission line wire zone will be retained and will not be subject to commercial forestry. This tapered vegetation will minimize the contrast of the poles and wires and overall visual impact.

From other viewpoints, including those that are not elevated, existing forest patterns may provide screening. The converse also may be true; recently harvested areas may enhance visibility of the project. The Department recognizes that as a result, regeneration of harvested areas may increase screening from some vantage points, and future harvesting may reduce screening. Harvesting limitations adjacent to resources such as rivers, streams, and great ponds will preserve screening in many important areas. Finally, the Department recognizes that, should commercial forestry activity result in significant clearing that increases visibility of the project, the reasonable expectations of an individual viewing this cleared area along with the project should be adjusted. As a result of these factors, the Department finds the location of portions of the project within commercial timberland that may be harvested at some point in the future does not alter the Department's conclusions regarding the scenic impacts of the project.

(4) Overall Findings Regarding Scenic Impacts

The project from Beattie Township to Lewiston extends a total of approximately 145 miles within the State. Much of the project, 92 miles, is co-located alongside an existing transmission line, while Segment 1 will be a new 53.1-mile corridor that will run through a predominantly forested and undeveloped area in western Maine. The scenic character of all these areas is important to residents and visitors, alike. The project as designed and as required through conditions of this Order minimizes the visual impact to the fullest extent possible and takes into account the scenic character of the surrounding area.

²³ Tapering near Coburn Mountain and Rock Pond (which are in Segment 1) is required in this Order to mitigate visual impacts. Tapering along the entire Segment 1 corridor, except for where taller vegetation is required across the entire width of the corridor, is also a condition of this Order and discussed further in Section 7, below.

As discussed above, in some areas the corridor will be the most visible component of the project, while from other locations the poles or conductors will be the visible project feature. From a range of vantage points along the entire corridor and near substations proposed for upgrades, the Department considered landscape compatibility, scale contrast, and spatial dominance of the project. Key observation points and other vantage points are discussed above. Upon completing this review, the Department finds the project will not have an unreasonable adverse effect on scenic uses or character of the surrounding area, provided the applicant:

- Tapers the vegetation in the corridor within the viewshed of Coburn Mountain (between structures #3006-634 and #3006-616) and Rock Pond (between structures #3006-731 and #3006-729);
- Maintains a minimum vegetation height of 35 feet within 100 feet of Moxie Stream;
- Uses non-specular conductors within the viewshed of Coburn Mountain (between structures #3006-634 and #3006-616), Rock Pond (between structures #3006-731 and #3006-724), Moxie Stream (between structures #3006-542 and #3006-541), and the Appalachian Trail (between structures #3006-529 and #3006-458);
- Uses shorter poles along Moxie Pond (structures #3006-529 and #3006-458); and
- Plants and maintains vegetated roadside buffers, and replaces any dead buffer plantings within one year of the vegetation dying, at the following locations: Old Canada Road (Route 201) crossings in Johnson Mountain Twp and Moscow, Troutdale Road crossing in Bald Mountain Twp, and on the south side of Fickett Road in conjunction with the Fickett Road Substation.

6. EXISTING USES

Site Law requires an applicant to demonstrate that the proposed development will not adversely affect existing uses or scenic character. 38 M.R.S. § 484(3). Similarly, NRPA requires that the proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational, or navigational uses. 38 M.R.S. § 480-D(1). Scenic impacts of the project are evaluated in Section 5 of this Order. The Department addressed the scenic impact standards of both Site Law and NRPA and found that the project will not have an unreasonable adverse effect on scenic uses or scenic character. As a result, because the scenic impact of the project is not unreasonable, the Department further finds the project will not have an unreasonable adverse effect on existing uses that are related to the scenic character.

The impact of a project on existing uses, however, is not limited to a project's impact on scenic uses and scenic character. A project could, for example, physically interfere with existing uses and result in an unreasonable adverse effect. Thus, the Department evaluated the potential impact of the applicant's project on existing uses, looking beyond the scenic impacts.

The majority of testimony, public comment, and record evidence focuses on the potential impact of Segment 1.

In this area of the project the primary activity is commercial forestry. The applicant has negotiated acquisition of the corridor and access to the corridor with private landowners engaged in commercial forestry adjacent to the corridor. The successful result of these negotiations is compelling evidence the project will not have an unreasonable adverse effect on existing commercial forestry activity. Testimony from Kenneth Freye also established that the location of the project was shaped to ensure compatibility with forestry activity. The owner of Spencer Road at the time the applicant was acquiring the rights-of-way for the project opposed locating the transmission line along this land management road because the owner wanted to preserve flexibility in its future use and location of this road as part of its forestry operations. It is a reasonable inference that the landowners and forestry operators involved that did sell a right-of-way or property to the applicant to be used for this proposed project were of the view that the construction and existence of the project would be compatible with the commercial forestry uses in the affected areas.

Testimony established that outdoor recreation is an important activity in the western Maine region in which the Segment 1 corridor is proposed.

Recreation is important to residents and camp owners, as well as to visitors and those who own businesses that cater to visitors, such as those offering lodging to guests or guide services. Recreation activities in the area include hunting, fishing, hiking, and snowmobiling. The project will not impose limitations on these activities. Outdoor recreationalists will be able to cross the corridor and access the same areas they have traditionally used. For example, with regard to snowmobiling, Bob Meyers, Executive Director of the Maine Snowmobile Association, testified that many snowmobile trails are located along transmission line corridors. With regard to hiking, the corridor can be crossed by foot. The most prominent hiking trail that intersects the corridor is the Appalachian Trail.

Testimony established that in the 1980s this segment of the AT was rerouted, resulting in the trail crossing a previously existing transmission line corridor. The proposed line will be co-located with this previously existing transmission line corridor and within a previously existing transmission line right-of-way where the AT and the project intersect. Hiking will not be impeded here or at other hiking trails. With regard to fishing, the proposed line was routed to avoid some particularly sensitive fish spawning stream headwaters, and the line in some potentially affected sensitive fish spawning areas will be elevated to allow for the growth of taller vegetation within the corridor that will provide shade for fish habitat. In addition, culvert replacements required to be funded by the applicant as a condition of this Order (see Section 7) will improve fish passage and should therefore enhance fishing opportunities.

Finally, with regard to navigational uses, no portion of the project will be located in a water used for navigation. Therefore, the project will not impact navigational uses.

In Segments 2 through 5, the transmission line is proposed to be co-located either within or immediately adjacent to an existing corridor.

The Department finds this co-location of the proposed line will greatly limit the impact on existing uses and not result in an unreasonable impact.

In sum, the Department finds the project will not have an unreasonable adverse impact on existing uses, including recreational or navigational uses.

7. NATURAL RESOURCE IMPACTS

Site Law, 38 M.R.S. § 484(3), requires an applicant to demonstrate that a project will not adversely affect any natural resources. Chapter 375, § 15, which is part of the Department's rules implementing Site Law, recognizes the need to protect wildlife and fisheries by maintaining suitable and sufficient habitat, including travel lanes between areas of available habitat, and the susceptibility of certain species to disruption and interference of lifecycles by proposed alterations and activities. Chapter 375, § 12 recognizes the importance of preserving unusual natural areas for educational and scientific purposes. In addition, 38 M.R.S. § 487-A(4) requires the Department to consider whether any alternatives to the proposed location and character of the transmission line may lessen its impact without unreasonably increasing its cost.

NRPA, 38 M.R.S. § 480-D(3), requires the applicant to demonstrate that the proposed project will not unreasonably harm significant wildlife habitat; freshwater wetland plant habitat; threatened or endangered plant habitat; aquatic or adjacent upland habitat; travel corridors; freshwater, estuarine, or marine fisheries; or other aquatic life. The Wetland and Waterbodies Protection Rules, Chapter 310, and the Significant Wildlife Habitat Rules, Chapter 335, interpret and elaborate on the NRPA criteria for obtaining a permit. These rules guide the Department in its determination of whether a project's impacts would be unreasonable. Each application for a NRPA permit that involves a wetland alteration; an alteration to a river, stream, or brook; Inland Waterfowl and Wading Bird Habitat (IWWH); a SVP²⁴; or TWWH, must provide an analysis of alternatives, which is a part of the Department's analysis of whether a proposed project's environmental impacts are unreasonable.

A. Overview

(1) Alternatives Considered by Applicant

The applicant submitted an alternatives analysis for the proposed project completed by Burns and McDonnell and dated September 27, 2017. The stated project purpose is to deliver up to 1,200 MW of Clean Energy Generation from Quebec to the New England Control Area via a HVDC transmission line. The applicant evaluated the No-Action alternative but determined that it would not meet the project goals.

²⁴ See the project description for further discussion of how the abbreviation SVP is used in this Order and refers to vernal pool depressions and critical terrestrial habitat.

a. Corridor Routes and Underground Alternative

The applicant evaluated five potential transmission corridor routes as part of its initial analysis. The evaluation process included assessment criteria for the following priorities (in order of importance): avoidance of conserved lands; undeveloped right-of-way; amount of clearing required; number of stream crossings; transmission length; wetland impacts based on National Wetland Inventory mapping; Deer Wintering Area (DWA) impacts; IWWH impacts; public water supplies impacted; sand and gravel aquifers impacted; and number of parcels crossed.

Alternative Route 1 was based on a similar project the applicant proposed in the late 1980's. At that time, CMP had acquired title, right, or interest in a corridor that ran from western Maine to Lewiston and was 119.3 miles long. However, the options that CMP had to acquire much of that ROW have expired and portions of the area are now subject to conservation easements. A new crossing of the AT, where no transmission line currently crosses the trail, also would be required. CMP concluded the existence of these conservation easements makes acquiring new ROW easements along this route nearly impossible. AT crossing rights also would be difficult to obtain and a new crossing less desirable than the proposed co-located crossing under the Preferred Alternative.

When compared to the Preferred Alternative, this alternative Route 1 would have resulted in: crossing two more conserved parcels with an increase in the impacts on conserved land of 233.3 acres; an increase of 39.6 miles of undeveloped ROW; an increase in the amount of cleared area of 111 acres; a decrease of 27 stream crossings; a decrease of 25 wetland crossings, but an increase of 42 acres of wetland impact; the same number of DWA crossings, but an increase of 27 acres of impact; a reduction of 3 IWWH crossings, but a 0.4 acre increase in impact.

Alternative Route 2 would cross into Maine in Beattie Township and follow the proposed route for several miles, then turn south until it reached the existing Kibby Wind Farm generator lead line. The corridor would parallel the Kibby Wind Farm generator lead line to the Bigelow Substation in the Town of Carrabassett Valley. From the Bigelow Substation, Alternative Route 2 would proceed east to the Wyman Hydro Substation in Moscow and continue to Lewiston in the same corridor as is proposed. This route would cross the AT near the Wyman/Carrabassett Valley town line. A crossing of the AT in this area by a utility corridor does not presently exist. The U.S. Department of Interior refused to grant the Kibby Wind Farm generator lead line the right to cross the AT, either overhead or below ground, in this same general area. CMP concluded it was unlikely it could obtain an easement for this portion of the project, making this alternative not practicable. Alternative Route 2 would be 138.5 miles long. When compared to the Preferred Alternative, this route would have resulted in: crossing three more conserved parcels with an increase in the impacts on conserved land of 11.2 acres; a decrease of 36.2 miles of undeveloped ROW; a decrease in the amount of cleared area of 153 acres; an increase of 8 stream crossings; an increase of 20 wetland crossings, with an increase of 37 acres of wetland impact; the same number of DWA crossings, but a decrease of 0.3 acres of impact; the same number of IWWH crossings, but a 6.2 acre decrease of impact.

The applicant examined two alternative locations and HDD for the crossing of the Upper Kennebec River. The two alternative locations considered for the crossing of the Upper Kennebec River consisted of one at Harris Station (referred to as the Brookfield Alternative, or the third route alternative), and one just below Harris Station, (referred to as the CMP Land Alternative, or the fourth route alternative). These alternatives would have resulted in an extra 14.5 miles and 13.3 miles of transmission line construction, respectively. The Brookfield Alternative would have required Brookfield to agree to reopen its Federal Energy Regulatory Commission license for its hydroelectric dam to allow the additional transmission line within the project boundary. Both the Brookfield Alternative and the CMP Land Alternative would require additional ROW easements within the Moosehead Kennebec Headwaters conservation easement, which CMP concluded is not allowed under the terms of the conservation easement, making these alternatives not practicable.

The fifth alternative considered by CMP involved running the transmission line under the Upper Kennebec River using HDD technology. The applicant initially stated this alternative was too expensive and potentially not technically feasible.

However, following requests by the intervenors and members of the public to avoid an overhead crossing of the river to reduce scenic impacts, and the Department's expression of concerns with the overhead crossing, CMP further examined locating the transmission line under the Upper Kennebec River. CMP subsequently proposed running the transmission line underground in this location as part of its Preferred Alternative.

The Preferred Alternative described more fully in Section 1, Project Description, does not contain the least amount of new corridor clearing; however, CMP concluded in its analysis, that the Preferred Alternative is the shortest practicable route from the Canadian Border to an existing transmission line corridor. In siting the Preferred Alternative, the applicant chose a route that it states would avoid crossing conserved lands or ridgelines and would avoid natural resources and scenic resources to the greatest practical extent.

CMP's initial alternatives analysis did not include examination of locating the transmission line underground, except for the proposed underground crossing of the Upper Kennebec River described above. A more widespread underground alternative, however, was examined through hearing testimony. This includes the feasibility of locating the line underground, in general, as well as along the Spencer Road or Route 201.

Finally, in the course of the permit review process the applicant also proposed modifying the original preferred route with the Merrill Strip Alternative. This alternative is a slight modification of the original preferred route. It is approximately 0.4 miles shorter, eliminates impacts to one SVP (0.02-acre reduction) and one stream crossing, and reduces the wetland impacts by 32,037 square feet. CMP stated that this route was initially ruled out because the landowner was asking 50 times the market value for the land. Ultimately, the applicant and this landowner reached an agreement and CMP obtained an easement for approximately 20 acres of land to enable it to propose using the

Merrill Strip Alternative as part of its Preferred Alternative. This strip is 1.0 mile long and 150 feet wide.

b. Substation and STATCOM Locations

The applicant evaluated six alternative locations and designs for the Merrill Road Converter Station. Two of the locations were ruled out because they were not large enough, one location was ruled out because a large portion of the property was mapped as either Scantic silt loam (typically a wetland soil) or Peat and muck (also wetland soils), and two other parcels were ruled out because they would have resulted in additional transmission line construction across Route 202 and the placement of double-circuit structures, which are not preferable from a reliability standpoint.

The applicant also evaluated other locations across the transmission system for the STATCOM units ultimately proposed to be located at the Fickett Road Substation. The applicant determined that the best location was as close to the Surowiec Substation as possible.

The Surowiec Substation is not large enough and site constraints, due to the location of Runaround Brook, prevent the equipment being located on the Surowiec Substation parcel. The preferred parcel minimizes the length of new transmission line that would need to be constructed between the two substations. The Fickett Road substation is located on the parcel to maximize the upland area used by the necessary structures and minimize the wetland impacts.

(2) Impact Minimization Efforts by Applicant

In addition to the landscape scale analysis, the applicant also evaluated site specific means to minimize impacts.

These included proposing to use 100-foot tall steel poles that can be placed farther apart than typical H-Frame structures, site-specific adjustments to structure locations, use and location of temporary roads, and substation design. The proposed use of taller structures reduces the number of poles that need to be placed, the amount of temporary construction road that would need to be created, and the number of poles located in wetlands. Other procedures the applicant proposed to minimize impacts included implementation of CMP's Environmental Guidelines, which include erosion and sedimentation control measures, pre-construction wildlife surveys, time of year restrictions on certain construction activities, and the use of third-party inspectors.

(3) Summary of Project Impacts

With the alternative ultimately selected by the applicant, which includes HDD for the Upper Kennebec River crossing and the Merrill Strip Alternative, CMP proposes to directly alter 4.124 acres of freshwater wetland and to indirectly alter 105.55 acres of forested wetland by converting it to shrub-scrub wetland to complete the NECEC project.

The applicant's proposal also includes: 674 crossings of rivers, streams, or brooks, of which 471 contain coldwater fisheries and five are Outstanding River Segments; 15.026 acres of impact to IWWH, which includes 0.017 acres of fill; 31.487 acres of impact to SVPs,²⁵ which includes 1.46 acres of permanent fill, 29.607 acres of clearing in uplands, and 3.895 acres of clearing forested wetland. The applicant's proposed route also crosses 22 DWAs resulting in a total of 83.5 acres of clearing, including 39.2 acres of impact to the Upper Kennebec River DWA. None of the DWAs are rated moderate or high value.

The project is located in or near habitat for the following species included on Maine's Endangered or Threatened Species list, or identified as species of special concern:²⁶

- Roaring Brook Mayfly
- Northern Spring Salamander
- Rusty Black Bird
- Long Eared Bat
- Little Brown Bat
- Small Footed Bat
- Brook Floater Mussel
- Northern Bog Lemming
- Great Blue Heron
- Golden Eagle
- Canada Lynx
- Bicknell's Thrush
- Wood Turtle

Additionally, the project was evaluated for impacts to 15 rare plant occurrences, as well as impacts to five unique natural communities, which were identified in or adjacent to the corridor. The identified rare plant occurrences and unique natural communities include: small whorled pogonia (a federally listed rare plant), Goldie's wood fern (a species of special concern), Jack Pine Forest (a critically imperiled plant community), Hardwood River Terrace Forest (an imperiled community), and Enriched Northern Hardwood Forest (a rare community).

B. Agency Comments

(1) Wildlife, Fisheries, and Other Natural Resources

MDIFW and Department staff reviewed the project impacts to wildlife, fisheries, and other natural resources.

²⁵ In its initial application, CMP identified 42 SVPs and 23 Potentially Significant Vernal Pools (PSVP). MDIFW raised identification concerns with 13 of these pools and apparent discrepancies in total area of impact to SVP habitat. Ultimately, after further analysis, CMP, DEP, and MDIFW agreed that the total number of SVPs impacted by the project is 61.

²⁶ Several of these species (Long Eared Bat, Canada Lynx) are federally listed, as well. Atlantic salmon also are federally listed, but not listed in Maine.

In a December 11, 2017, letter to the applicant following initial review of the proposal, Department staff stated: "The project crosses 67²⁷ rivers, streams, or brooks which contain brook trout habitat and five Outstanding River Segments and according to the vegetation management plan all vegetation over ten feet tall will be removed. While the Department has not yet made a determination whether the impacts to these resources are unreasonable there will certainly be impacts to these resources. Please provide a mitigation package to compensate for these impacts. The Department envisions this mitigation package will be the responsibility of CMP to implement, not simply providing additional [In-Lieu fee program] monies."

MDIFW provided comments on wildlife and fisheries impacts on March 15, 2018, June 29, 2018; December 7, 2018; February 1, 2019; and March 18, 2019. In its March 15, 2018 comments, MDIFW raised concerns about the lack of data on the presence or absence of a number of species listed on the Endangered or Threatened Species list, including Northern Bog Lemmings, Northern Spring Salamanders, Roaring Brook Mayflies, several species of bats, Wood Turtles, Rusty Black Birds, Great Blue Herons, and Golden Eagles. In addition, MDIFW requested more information on the project impacts to SVPs and requested marker balls be installed on the overhead crossing of the Upper Kennebec River to minimize the chance of Bald Eagles colliding with the wires. MDIFW requested a 25-foot setback for the use of herbicides from any wetland located in an IWWH and only the use of spot spraying of herbicides within the IWWH. MDIFW also expressed concern that the 25-foot wide buffers the applicant had proposed for streams crossed by the project was too narrow. This was a particular concern for the streams in Segment 1 and other coldwater fisheries streams.

Between March and December 2018, the applicant and MDIFW continued to meet and discuss the proposed project's various impacts to fish and wildlife and the applicant conducted field surveys for several wildlife species. During this time:

- The applicant determined the area identified as potentially providing habitat for Northern Bog Lemming did not contain that species.
- The applicant determined there were Northern Spring Salamanders and Roaring Brook Mayflies in two streams crossed by the project, Gold Brook and Mountain Brook.
- MDIFW recommended time of year restrictions for construction activities for wood turtles and Rusty Black Birds. For wood turtles, they recommended construction activities be limited in the 16 mapped habitats to between October 15 and April 15. For Rusty Black Birds, MDIFW recommended no construction activities in the mapped habitat between April 30 and June 30.
- MDIFW also recommended that a 10-15-foot high dense stand of spruce and fir be left in the Rusty Black Bird habitat, which is located in Parlin Pond Twp. and Johnson Mountain Twp.

²⁷ Based on further field analysis by the applicant, and verification by the Department, the number of brook trout habitat streams crossed by the project has been corrected to 375 since this letter was written. (See Appendix E for a list of waterbodies crossed by the project.)

- The applicant proposed in its Site Law application, prior to initial transmission line clearing and between April 20 and May 31, to complete surveys for heron colonies within or immediately adjacent to (within 75-feet) existing IWWH's within the NECEC project area. If discovered, CMP would notify and consult with MDIFW biologists.
- The applicant noted the requested herbicide spraying setbacks were already a part of CMP's Vegetation Construction Plan (VCP) and the Vegetation Management Plan (VMP).

In its December 7, 2018, comments, MDIFW memorialized a commitment by CMP to incorporate into its proposal:

- Ten travel corridors in Upper Kennebec River DWA. Eight of these travel corridors would be created by selectively cutting the NECEC corridor to promote softwood growth necessary to provide winter habitat for deer (Appendix C describes the vegetation management for deer travel corridors); two of these corridors would be adjacent to the Upper Kennebec River in the area where the transmission line would be underground, allowing maintenance of full height vegetation;
- The utilization of taller poles near Gold Brook and Mountain Brook, which would allow full canopy height vegetation over these streams to minimize the impact to Roaring Brook Mayflies and Northern Spring Salamanders; and
- The preservation of 717 acres of land in the Upper Kennebec River DWA.

Additionally, in response to the Department's December 11, 2017 letter, as well the Department's and MDIFW's concerns about project impacts to coldwater fisheries, the applicant modified its proposal in several ways. CMP agreed to incorporate into its proposal:

- A 100-foot riparian filter areas around all perennial streams in Segment 1 and all coldwater fisheries streams in the other segments (Appendix C describes these filter areas, referred to as buffers by the applicant; Appendix E identifies waterbodies crossed by the project); and
- Compensation for unavoidable impacts in the form of: (a) land preservation (Grand Falls Tract, Basin Tract, and Lower Enchanted Tract), (b) funding to improve fish passage by providing \$200,000 for replacement of culverts, and (c) providing \$180,000 for compensation for the conversion of forested riparian habitat.

(2) Unusual Natural Areas

The Maine Natural Areas Program (MNAP) reviewed the project for impacts to rare or unique botanical features. Much of the area in Segment 1 had never been surveyed for these features and MNAP requested that the applicant conduct surveys using qualified consultants. The applicant conducted those surveys during 2018. Surveys also were conducted in the remaining portions of the project to update surveys that had been conducted for previous projects. The surveys identified 15 rare plant occurrences and

five unique natural communities in or adjacent to the corridor, including the following: small whorled pogonia (also a federally listed rare plant), Goldie's wood fern (a species of special concern), Jack Pine Forest (critically imperiled plant community), Hardwood River Terrace Forest (an imperiled community), and Northern Hardwood Forest (a rare community).

To avoid impacts to the small whorled pogonia, CMP redesigned a short section of the transmission line in Greene. To minimize impacts to Goldie's wood fern, the applicant proposed to maintain a riparian buffer along a small stream but to remove capable species in the corridor. Within this buffer along the stream the applicant still will remove all capable vegetation and will remove the canopy. MNAP commented that this species is sensitive to canopy disturbances and requested the applicant provide compensation for the impacts by protecting a documented occurrence of Goldie's wood fern outside of the corridor or, if no suitable site is found, by protecting other properties containing rare forest-dwelling plant species in Western or Central Maine, providing funding toward MNAP's rare plant surveys, or some other mitigation proposal to conserve rare plant communities.

The project will result in 9.229 acres of clearing in a Jack Pine Forest located in Bradstreet Township.

There is only one other Jack Pine Forest Community known in the State and that is several miles north of this affected one, in the Number 5 Bog, which is a National Natural Landmark. MNAP requested compensation for this impact to the Jack Pine Forest. MNAP also reviewed the information on the Hardwood River Terrace Forest, which had been documented in 2007 for the MPRP project and determined that it is outside the NECEC Corridor.

In response to MNAP's comments, the applicant revised its proposed compensation plan to mitigate impacts to rare or unique botanical features. This revised plan includes a contribution to the Maine Natural Areas Compensation Fund for impacts to Goldie's Wood Fern and the Jack Pine Forest. In an email dated February 4, 2019, MNAP stated that the revised compensation plan addresses their concerns. The compensation plan proposes that the applicant will make a contribution to the Maine Natural Areas Conservation Fund in the amount of \$1,234,526.82. (See Appendix F, Table F-2 for the allocation of funding for different impacts.)

C. Public Hearing and Comments

(1) Alternatives Analysis

a. Applicant Testimony and Evidence on Alternatives

In its application, supporting documents, and witnesses' pre-filed testimony for the first segment of the public hearing, CMP provided evidence on its methods to avoid and minimize the impacts from the project, as described above.

This evidence included evaluation of the alternative routes described above, as well as the efforts the applicant took to site the line once a general location was chosen. On April 1, 2019, CMP's witnesses provided oral testimony on its alternatives analysis. The applicant's witnesses on this first day did not address the feasibility of locating the transmission line, or sections of the line, such as Segment 1, underground.

In response to the pre-filed direct testimony of witnesses for intervenor Groups 2, 6, and 8 highlighting the absence of evidence from the applicant on the option to bury the line (the underground alternative), the applicant provided pre-filed rebuttal testimony on the issue, including from new witnesses. Following this pre-filed rebuttal testimony and further pre-filed sur-rebuttal and supplemental testimony, the underground alternative was the focus of the second segment of the hearing, held on May 9, 2019.

On May 9, CMP's witnesses Justin Tribbet, Justin Bardwell, Thorn Dickinson, and Kenneth Freye provided testimony on the underground alternative for Segment 1 and the entire corridor, as well as along Route 201 and Spencer Road. CMP provided testimony concerning the constructability of an underground line, the feasibility of burying the line in the existing corridor, along Route 201, and along the Spencer Road, and the cost of different underground alternatives. For example, Bardwell testified that for each overhead conductor two underground cables would be needed, plus a spare. This is because of the power transfer capacity of the project, with the fifth cable being a spare. He explained that while other proposed projects with the same voltage included underground components with fewer cables, this was because other projects did not have the same power transfer capacity. Bardwell provided an overview of the construction process, including trenching and other techniques, the need to splice together cable sections approximately every 2,200 feet, and the use of concrete enclosures to protect the splices. He also testified to the environmental impacts of underground construction. Tribbet and Bardwell both testified to the cost of different underground alternatives. They estimated, for example, that locating just Segment 1 underground in the currently proposed corridor would result in a total project cost of \$1.6 billion, adding approximately \$640 million to the overall cost, or roughly an increase of 67 percent. Tribbet also addressed other transmission line projects with undergrounding technology, noting that each involves project-specific considerations. He listed projects such as Connect New York, Northern Pass, TDI Vermont, and Vermont Greenline and testified that none of these projects had demonstrated economic feasibility or secured a long-term transmission service agreement.

CMP witness Kenneth Freye testified that at the time CMP was evaluating route alternative it discussed options with the landowner of Spencer Road, Plum Creek Maine Timberlands, LLC. Plum Creek was opposed to having a transmission line along the road. Freye also testified that locating the line along Route 201 was not practicable for several reasons, principally because the Department of Transportation would not allow

the underground transmission line within the travel way of the road.²⁸ He testified that the remainder of the DOT right-of-way was not wide enough to accommodate an underground alternative. As a result, running the line underground along Route 201 would require acquiring land rights from residential, recreational, and small commercial landowners, which Freye testified likely would prove difficult.

b. Intervenor Testimony and Evidence on Alternatives

Group 1 testified that a similar project in Vermont has been permitted that could provide the power for the Massachusetts request for proposal, that the Vermont project would have no impacts in Maine, and therefore, Group 1 argued, the no action alternative is practicable.

Groups 2, 4, and 10 all argued that the applicant failed to meet its burden by not evaluating the underground alternative and that the project should be located either under Spencer Road or adjacent to Route 201.

Group 8 witness Christopher Russo testified concerning the undergrounding alternative. He stated that HVDC lines of the length proposed by CMP are located underground or underwater in the 13 of 14 instances worldwide.

Russo also reiterated the point other intervenors made that the Vermont route and the Northern Pass route were proposed to be located at least partially underground.

Group 6 witnesses also argued the lack of an analysis of the underground alternative was a flaw in the CMP application.

Group 3 witness Gil Paquette testified that locating the transmission line underground was not a practicable alternative. Among the factors he discussed in support of his overall conclusion were cost, cable slicing and associated vaults, and the need for thermal sand.

With regard to thermal sand he testified that in his experience the need for, logistics concerning, and cost of thermal sand is the single most overlooked aspect of undergrounding an HVDC transmission line. He cited his experience with a project where the need for thermal sand was not appreciated until late in the planning process and that based on his familiarity with the geology in western Maine it is highly likely the majority of Segment 1 would require thermal sand.

²⁸ Bardwell stated in his pre-filed supplemental testimony that splice vaults, which would be a required component for underground construction, are prohibited within the travel lanes by Maine DOT rule, 17-229 CMR Ch. 210, § 10(5), Pt. D.

c. Public Testimony and Comments on Alternatives

Members of the public submitted written comments and testified at the hearing on the applicant's alternatives analysis and the choice of the proposed route. Several members of the public opposed to the project testified that an underground alternative would have less visual impact, be safer, and require a narrower cleared corridor. Many interested persons testified they believed the line should be buried under Spencer Road or Route 201. Several members of the public testified that they believed the line should be buried under Spencer Road. One person in favor of the project testified that undergrounding would be too costly, and therefore is not a practicable alternative.

(2) Impacts to Wildlife, Fisheries, and Other Natural Resources

a. Applicant Testimony and Evidence on Impacts

In its application and its hearing testimony, the applicant described the methods used to locate and design the project in the least environmentally damaging manner. The applicant's witnesses at the hearing testified that the project would not cause unreasonable fragmentation of the forest habitat because the project is located in working forest that is already fragmented by clear cuts, partial-cuts, log yards, skid trails, and logging roads. They contend that the project will provide improved habitat for certain species of wildlife that prefer early successional forest, such as deer, moose, bear, fox, rabbits, and other wildlife species. The applicant provided testimony that the proposed project would not unreasonably impact coldwater fisheries or rare or threatened species and that sufficient compensation had been proposed for the impacts that would occur. In the course of the hearing process the applicant also committed to not using herbicides within Segment 1; this was stated by CMP witness Mirabile in his pre-filed supplemental testimony and reaffirmed orally at the May 9 hearing.

The applicant also provided testimony, in response to questions from the Department, on the possibility of tapering additional areas along Segment 1 or allowing for taller vegetation in the corridor, including through the use of taller poles. Mark Goodwin testified that the applicant did not believe additional tapering or taller poles/vegetation were necessary, but expressed a preference for tapering. Nicholas Achorn testified on the construction process for poles 100-feet and taller. He noted some differences in construction and extent of permanent impacts depending on whether poles are directly imbedded or constructed using caisson foundations. Under either type of construction, he testified the work pad size requirement around the pole would be same.

b. Intervenor Evidence on Impacts

Intervenor Groups in Opposition: Group 1 witness Janet S. McMahon; Group 2 witnesses, Chris Russell, Greg Caruso, and Roger Merchant; Group 4 witnesses Dr. David Publicover, Dr. Aram Calhoun, Ronald Joseph, Todd Towle, and Jeffrey Reardon, all testified that the project would have an adverse impact on wildlife and fisheries. Witnesses McMahon, Merchant, Publicover, Calhoun, and Joseph testified on the

potential impacts the project may have on forest fragmentation. Witnesses Russell, Caruso, Towle, and Reardon all testified on the impacts to coldwater fisheries, particularly brook trout.

McMahon and Merchant testified on the importance of unfragmented habitat to so-called “umbrella” species such as pine marten.²⁹ They stated that even though the forest may be somewhat fragmented due to logging practices, these features are temporary in nature. The transmission corridor would represent a permanent fragmenting feature in the landscape. Publicover testified that the fragmentation of the forest would be permanent, and asserted the global importance of the western Maine mountains region in terms of ecological diversity.

Reardon testified that the smaller perennial and intermittent streams that would be impacted by the project are “the best of the best” brook trout habitat. He testified that many of the streams impacted by the project in Segment 1 are exceptionally valuable, such as Gold Brook and Tomhegan Stream, which provide brook trout spawning and rearing habitat, and Cold Stream, in which brook trout seek thermal refuge during warm temperature months. He explained that in a 150-foot wide, cleared corridor without taller trees or a full canopy the streams would not have the necessary input of large woody debris from dead trees necessary for healthy habitat. He stated that the proposed compensation parcels offered by CMP as mitigation for these impacts do not contain the same quality habitat as the area being impacted by the project. Finally, he stated that based on his experience with stream-crossing replacements, CMP’s statement that 20 to 30 culverts could be replaced with the \$200,000 proposed in the compensation fund was not realistic. He testified that in his experience, a single crossing could cost in the range of \$50,000 to \$100,000.

An Intervenor Group 4 witness, Ronald Joseph, testified concerning the impacts to deer wintering areas. Joseph stated that the proposed project crosses 22 deer yards. He described several instances of deer mortality due to a loss or fragmentation of the winter habitat, including an example of Chub Pond deer yard, not far from the project, that is no longer used because of timber harvesting in the area. He testified that the loss of deer yards and the decline in the deer population has a negative impact on the local economy in the vicinity of the proposed corridor due to the decline in the recreational use by hunters in the area.

An Intervenor Group 4 witness, Calhoun, testified that the project would adversely impact vernal pools and in particular pools that are in proximity to one another. Calhoun testified that these closely related pools, known as poolscapes, would be unreasonably impacted by being fragmented by the clearing of vegetation for the proposed transmission line.

²⁹ As described at the hearing, protecting for an umbrella species will also provide protection for a wide range of other wildlife with overlapping or similar habitat needs, including the need for unfragmented habitat.

Neutral Intervenor Groups: Group 5 did not provide any testimony concerning impacts to wildlife and fisheries.

Intervenor Group 6 witnesses, Dr. Malcolm Hunter, Jr., Rob Wood, Andy Cutko, Bryan Emerson, and Dr. Erin Simons-Legaard provided testimony concerning forest fragmentation. Hunter testified on the types of impacts associated with fragmentation, including habitat loss and alteration, increased edge and reduced interior, and potential long-term consequences. He asserted: “The proposed mitigation and compensation does not adequately address the cumulative impacts of the full array of Maine’s wildlife.” Group 6 witnesses Wood, Cutko, and Emerson jointly testified that the effect of the proposed corridor would be greater than traditional sustainable forestry. They suggested in their testimony methods to minimize the impacts of the project on forest fragmentation. They submitted an exhibit that is a map showing nine areas where taller poles could be utilized to allow 35-foot tall vegetation to remain under the wire zone in order to provide passage for umbrella species such as pine martin. They testified that the taller vegetation also would minimize impacts to any coldwater fisheries located within those nine areas. They suggested that the corridor could be narrowed or built using what they referred to as “V-shaped vegetation management,” to further reduce impacts to wildlife habitat. They emphasized the need for mitigating or compensating for remaining habitat fragmentation impacts by reducing or preventing fragmentation elsewhere in the affected region through land conservation. They offered testimony, similar to that of Reardon, explaining why the funding for culvert replacements proposed by CMP was unlikely to be sufficient to support the number of replacements described by the applicant. Finally, Simons-Legaard testified that the proposed corridor would have significant adverse impacts on pine marten and other species, and on the value of mitigation alternatives, including tapering, taller vegetation, and conservation.

Intervenor Groups in Support: Intervenor Groups 3 and 7 did not provide testimony concerning wildlife or fisheries.

c. Public Testimony and Comments

Members of the public submitted written comments and testified at the hearing on the issues of impacts to wildlife, fisheries and other natural resources. Some members of the public commented that herbicide use and an increase in water temperatures from less shading would result in an unreasonable impact to brook trout. Although it was not always clear from the testimony and comments which portion of the 145-mile long project members of the public were discussing, generally the focus was the 53.1-mile long Segment 1.

Many public comments and testimony in support of the project acknowledged the impacts to wildlife and fisheries, but stated that the benefits of the project, in particular with respect to a reduction in greenhouse gas emissions, outweigh the impacts, thereby urging the Department to find that the impacts would be reasonable.

D. Department Analysis, Findings, and Conclusions

(1) Alternatives Analysis

The Department begins its evaluation of natural resource impacts of the NECEC project with a review of the applicant's analysis of alternatives. Chapters 310 and 335 require an applicant to submit an analysis of whether there is a practicable alternative to the project that would be less damaging to the environment and this analysis is considered by the Department in its assessment of the reasonableness of any impacts.

The basic methodology the applicant used in its analysis of alternative routes is sound. The applicant began by evaluating alternatives at a landscape scale and used a reasonable list of factors to assist with comparison. These are factors available to the applicant at the site selection stage of the project and that serve as a reasonable proxy for likely environmental impacts, as well as the practicability of a project. For example, National Wetland Inventory data, while not accurate enough to use at the permitting phase, is appropriate for a prospective developer to review when selecting between alternative sites or routes and attempting to minimize wetland impacts. Consideration of the location of conserved lands is reasonable and appropriate for several reasons. For example, conserved lands often are conserved because of their environmental value and are more likely to be areas used by the public for recreation purposes. Additionally, locating a corridor within conserved lands may not be legally possible depending on the nature of the conservation. The length of undeveloped right-of-way also is a valuable site selection factor. While a shorter corridor could contain more significant natural resources than a longer corridor, the length of corridor to be cleared is a reasonable proxy for environmental impact, especially when considered in conjunction with other environmental screening factors (e.g., presence of IWWH and DWAs), as was done by the applicant. In sum, the Department finds the factors considered by the applicant in its alternative analysis were appropriate and sufficient in number and scope.

The Department also finds the applicant applied these factors appropriately and reasonably selected the route reviewed in this Order.

Alternative Route 1 is not the least environmentally damaging alternative in light of the added length of undeveloped right-of-way, extent of conservation lands impacts, and new Appalachian Trail crossing. The route also does not appear practicable given the easement areas it would have to cross, parcel count, and AT crossing rights that would be needed. Alternative Route 2 is slightly shorter than the Preferred Alternative and would involve considerably less new right-of-way, although the identified resource impacts within Alternative Route 2 and the Preferred Alternative are comparable. The new AT crossing and challenge and cost of navigating through or around the Bigelow Preserve do not make Alternative Route 2 a practicable alternative. The Department also finds that neither the Brookfield Alternative nor the CMP Land Alternative are the least environmentally damaging practicable alternative in light of having to run the corridor through an area subject to a conservation easement that does not allow the project development, the added new right-of way needed, and environmental impacts when compared to running the transmission line under the Upper Kennebec River.

Within the corridor and project area for the Preferred Alternative, on the site-specific scale, the applicant sited structures, including buildings and equipment for the substations and the poles for the transmission line, outside of protected natural resources and valuable habitat to the extent practicable. The applicant also proposes to utilize construction Best Management Practices to minimize impacts to resources adjacent to the structures and roads being built. Special design accommodations are proposed for individual resources in specific locations. For example, in Greene (Segment 3) the applicant proposes to rebuild two existing lines and redesign and relocate a 1.5-mile portion of the proposed transmission line to avoid tree clearing and the associated impacts to nearby whorled pogonia. In Appleton Twp. and Johnson Mountain Twp. (both Segment 1) the applicant proposes taller poles at the crossings of Gold Brook and Mountain Brook to allow for taller vegetation to help conserve Roaring Brook Mayflies and Northern Spring Salamanders. In Parlin Pond Twp. (Segment 1) maintenance of 10- to 15-foot tall spruce/fir within the corridor is proposed to protect Rusty Black Bird habitat. Numerous rare plant occurrences also would be avoided and worked around.

The applicant has made two notable modifications to its proposal after its original alternatives analysis, locating the proposed transmission line under the Upper Kennebec River through the use of HDD technology and adjusting the corridor to stay out of the LUPC's Recreation Protection Subdistrict around Beattie Pond through selection of the Merrill Strip Alternative. The underground crossing of the Upper Kennebec River reduced impacts to existing scenic and recreational uses of that resource and the Merrill Strip Alternative reduced impacts for users of Beattie Pond. Both have been appropriately incorporated into the project by the applicant and reflect the value of the permit review process and the potential for projects to evolve during this process. It is unlikely an overhead crossing of the Kennebec River would have satisfied the applicable visual impact standards and the modification of the route in the vicinity of Beattie Pond, through the Merrill Strip Alternative, responded to concerns raised in the course of the LUPC's review.

Also, in the course of the review process, CMP considered and presented testimony on the alternative of locating the transmission line underground. This alternative was not originally considered by CMP in its application materials. Hearing testimony by Paquette indicated this exclusion was rational because locating the line underground was so obviously unreasonable to anyone with expertise in this construction technique that it made sense CMP did not devote time to analyzing an option that would not be viable. While this may explain the exclusion, the Department finds consideration of the underground alternative is both a relevant and important component of an evaluation of the project. As intervenors testified, other existing and proposed transmission lines have been constructed or proposed to be constructed underground. The possibility of doing the same with the present transmission line warrants consideration, even if ultimately ruled out.

The applicant submitted testimony and exhibits on the underground alternative in response to evidence submitted and arguments made by intervenors. The Presiding Officers allowed the intervenors to submit written sur-rebuttal and scheduled an

additional hearing day for testimony and cross-examination of witnesses on this topic, as well as some other testimony. The Department finds that the evidence in the record on the underground alternative is sufficient for the Department's review of whether the applicant has met its burden of proof on the licensing criteria, including the requirement that the applicant provide an analysis of alternatives.

There is intuitive appeal to the argument that locating the transmission line underground would be less damaging to the environment and have less of a scenic impact. No conductors or poles would be visible and a narrower corridor could be maintained. Upon examination of the underground alternative, however, the Department finds that constructing the line underground, outside of the Upper Kennebec River crossing, is not a less damaging practicable alternative. In reaching this conclusion, the Department considered the evidence submitted by all the parties and the research of Department staff.

Bardwell, in testimony the Department found credible, explained underground construction. To locate a transmission line underground, the most affordable and common construction technique, in most areas, would be direct burial. This involves laying sections of cable within an open trench. For this project, because of its power transfer capacity, four cables, plus a spare for reliability, would be located in the trench. The trench would be a minimum of six feet deep and five feet wide at the base and have a minimum surface width of 12 feet. A work area approximately 75 feet wide would be needed during installation and a cleared corridor of this same width would be maintained after construction. The 75-foot wide cleared area, allowed to regenerate with scrub-shrub species, is needed to keep root systems from larger trees out of the cables.

A trench would be opened to accommodate a length of cable, which would be delivered in 2,500-foot long segments that would be spliced together approximately every 2,200 feet. Each splice would be protected by pre-cast concrete components measuring approximately 12 feet long by four feet wide. At each jointing location an excavation approximately 60 feet long, 20 feet wide, and seven feet deep would be opened.

A concrete pad would be poured in the bottom and the spliced cables, each with its pre-cast concrete protection, would be located on top of this pad and backfilled. Beyond the splice vault, cables would be located on a sand bedding and covered with a protective concrete layer. The trench would be backfilled above the concrete. To facilitate construction and ongoing maintenance, permanent access to each splice vault is required.

Paquette testified that thermal sand likely would be needed for much of the Segment 1 corridor due to the cable that would have to be used for this project and the properties of the soils in western Maine. While the volume of thermal sand that would have to be used is not clear from the record, the Department finds credible that thermal sand would have to be imported to enable running the transmission line underground.

This type of underground construction effort would result in a greater environmental impact than the proposed overhead alternative. In order to install cables underground in Segment 1, the cables would need to be buried under the streams, wetlands, vernal pools,

and other natural resources. While this is possible, as was the case for the natural gas pipelines that were installed in the late 1990's, the construction is costly, time consuming, and difficult, especially if there is rainy weather. While some impacts from trenching might be temporary, such as trenching through a wetland, this same impact is avoided with the overhead alternative. The nature and extent of required site access during construction and the permanent access that would be maintained post-construction is more extensive with the underground alternative and would result in greater impact. Furthermore, with the underground alternative a cleared corridor still must be maintained and would be wider, at 75 feet of clearing, than a tapered corridor, with approximately 54 feet of clearing as discussed in this section. Additionally, a wider clearing would have greater scenic impacts from some locations, such as Coburn Mountain, and create more of a fragmenting feature. Taller vegetation within certain portions of the corridor, something required in this Order to minimize environmental impacts associated with overhead construction, would not be an option with an underground alternative.

When the environmental impacts of undergrounding is considered along-side the logistical challenges, such as the splicing boxes needed every 2,200 feet, the need for permanent access roads to these splicing boxes, hauling in thermal sand, hauling out or otherwise disposing of material that cannot be backfilled, the infrastructure upgrades needed to the road network, and the increased cost of this method, the Department finds locating Segment 1 (or the entire project) underground within the corridor is not a less environmentally damaging practicable alternative.

While some of the environmental impacts associated with the underground alternative along the proposed corridor, particularly Segment 1, could be reduced with co-location of an underground transmission line along Route 201 or Spencer Road, the Department finds neither alternative is practicable for the reasons testified to by Freye and Bardwell, including the feasibility of acquiring the legal right to run the transmission line in either location and the associated cost.

Additionally, the Department concurs with the applicant's alternatives analysis for the Merrill Road Converter Station, the Fickett Road Substation, and the remainder of the substation upgrades.

Finally, the Department considered the no action alternative. Group 1 argues that the Department should deny the applications because there is already an approved project in Vermont that, if constructed, would not have any impacts in Maine. The Department did not evaluate that approved project as an alternative because it does not meet this applicant's project needs. The Department declines to interpret an alternatives analysis as requiring an assessment of whether third party commercial competitors in other states may be able to fulfill the stated project purpose by some other means. The Department requires applicants to examine the no build alternative, alternative sites, alternative designs, and reductions in the scope of the project in an alternatives analysis and the applicant has done so in this case.

In sum, the Department finds that the selected above ground alternative and associated substation improvements are the least environmentally damaging practicable alternatives. Additionally, in the course of evaluating the proposed transmission line, including as part of the Department's assessment of the applicant's alternatives analysis and review of scenic impacts and wildlife impacts, the Department considered evidence regarding the transmission line location, character and impact on the environment and risks to public health or safety. The Department finds no further project modification or conditions regarding the transmission line's location, character, width, or appearance, beyond what is required by this Order, are warranted, under 38 M.R.S. § 487-A(4) or otherwise, to lessen the transmission line's impact.

(2) Wildlife, Fisheries, and Other Natural Resources

Chapter 375, § 15, implementing Site Law, requires an applicant to make adequate provision for the protection of wildlife and fisheries by maintaining suitable and sufficient habitat, including travel lanes between areas of habitat. NRPA, and the pertinent regulations promulgated under it, Chapters 310 and 335, recognize the importance of rivers, streams, and brooks; wetlands; and SWHs, including SVPs and IWWHs. The rules support a goal of no net loss of function and values, establish the criteria for avoidance and minimization of project impacts and state that some projects, even if the impacts have been avoided and minimized to the greatest practical extent, still may be unreasonable. In its review, the Department considers evidence concerning buffer strips of sufficient area to provide wildlife with travel lanes, protection of wildlife and fisheries lifecycles, and disturbances to high and moderate value deer wintering areas, threatened or endangered species, SVPs, and high or moderate value waterfowl and wading bird habitat.

a. Habitat Fragmentation and Wildlife Travel Corridors

Segment 1 of the project involves the creation of a new corridor through a forested area in western Maine. Group 6 testimony establishes this area is part of a largely unfragmented forest block that is more than 500,000 acres, which itself is part of an even larger area that is one of the world's last remaining contiguous temperate broadleaf-mixed forests. The western Maine region supports exceptional biodiversity and is expected to be especially effective at maintaining biodiversity as the climate changes. These qualities make the area unique and important for wildlife.

Within this area there also is an extensive network of land management roads and some residential camp and other development. Forest management is the predominant activity. Several witnesses testified the existing landscape is a mosaic of various aged forest, ranging from mature forest to recently harvested areas. The mosaic changes over time as harvested areas mature and mature areas are harvested.

Although the area is not completely undeveloped and is subject to active timber management, a transmission line corridor in the western Maine area where Segment 1 is proposed could contribute to habitat fragmentation and have unreasonable adverse

impacts on wildlife as a result of the effects on wildlife travel lanes and lifecycles and accessibility to suitable and sufficient habitat. Fragmentation occurs when contiguous habitat is broken into smaller, more isolated patches. CMP acknowledged in its Site Law permit application: “Transmission line corridors present potential direct impacts, as they may affect species movement, dispersal, density, nesting success and/or survival. . . . For the undeveloped corridor of Segment 1, impact may include fragmentation and creation of new linear edges. . . . Habitat conversion along transmission line corridors results in a loss of habitat types which, in turn, may adversely impact species that are reliant on the original habitat types.” (Site Law Application, pg. 7-23.) Group 4 and Group 6 testimony addresses the negative results associated with fragmentation, such as impacts to wildlife movement, reduction in accessible habitat, an increased in “edge” – the border between forest and an opening – and reduced interior, as well as biodiversity decline.

The Department finds that as Segment 1 initially was proposed, the applicant had not made adequate provision for the protection of wildlife; the proposal’s contribution to habitat fragmentation and impact on habitat and habitat connectivity was an unreasonable impact on wildlife habitat. Through modifications CMP made to its proposal during the permitting process, these potential wildlife impacts have been reduced. Through further modification required as a condition of this Order, adequate provision for the protection of wildlife will be achieved.

The project improvements to which CMP committed through written submissions filed with the Department during the permitting process include:

- Maintaining taller, softwood vegetation in the Upper Kennebec River DWA to provide travel corridors for deer.
- Maintaining full canopy height vegetation at the Gold Brook and Mountain Brook crossings. While the primary purpose of maintaining taller vegetation within the corridor in these locations is the protection of Roaring Brook Mayfly and Northern Spring Salamander habitat, the taller vegetation also helps minimize the fragmenting effect of the corridor.
- Maintaining tapered vegetation in the area visible from Coburn Mountain and another area visible from Rock Pond, for the purpose of minimizing the visual impact. The tapered vegetation in the corridor also benefits wildlife.
- Expanding the riparian filter areas on coldwater fisheries streams to 100 feet, and on all other streams to 75 feet.

These measures are expected to reduce the impacts of the Segment 1 corridor, but are not sufficient to avoid substantial and harmful fragmenting of habitat.

The Department finds that additional mitigation is required to satisfy the Site Law standards discussed above. This finding is supported by testimony from Group 4 and Group 6 intervenors. For example, Hunter states in his February 25, 2019 pre-filed testimony: “CMP has made adjustments to its original compensation plan to accommodate for corridor impacts to white-tailed deer (particularly wintering habitat) and a few selected rare species (Roaring Brook Mayfly and Northern Spring Salamander).

While deer have been identified in this process because of their regulatory standing, there are approximately 800 species of vertebrate wildlife in Maine and thousands of species of invertebrates, and many hundreds of species are present in the region affected by this corridor. Although habitat fragmentation affects different species in different ways, it is clear that many other species would be affected in addition to deer.” Simons-Legaard in her May 1, 2019 pre-filed testimony and her testimony at the hearing discussed pine marten, which she identified as an umbrella species – meaning that planning for marten often serves the purpose of planning for a wide range of other wildlife. She testified that pine marten utilize tree to tree movement and generally avoid large forest openings where they are vulnerable to predators. Although marten will cross corridors, they do not prefer cleared areas and their home ranges typically include areas with less than 30 percent unsuitable habitat. Simons-Legaard explained the relative benefit of modifying the project with tapering of vegetation and/or taller poles that would allow taller vegetation within the corridor. The weight of the evidence leads the Department to find that to ensure adequate provision for the protection of wildlife, CMP must take the following steps with regard to tapering, taller poles and taller vegetation, and conservation.

1. Tapering

A new, 150-foot wide, 50-plus mile long corridor, initially cleared and then maintained with non-capable vegetation only up to 10 feet in height, in the relatively undeveloped, forested region of western Maine would have an unreasonable adverse impact on wildlife and wildlife habitat. However, evidence in the record shows the project could be designed and built in a manner that would minimize these impacts so that the impacts would not be unreasonable. The Department finds that to do so CMP must maintain tapered vegetation, as described below, along the entire Segment 1 corridor except for the areas where CMP must maintain full height canopy vegetation, vegetation with a minimum height of 35 feet, or taller vegetation managed for deer travel corridors. A tapered corridor, more fully described in Appendix C, includes an approximately 54-foot wide area under the conductors (the wire zone) that is cleared during construction and maintained as scrub-shrub habitat during operation of the project. Outside the wire zone, which is located at the center of the 150-foot wide corridor, taller vegetation is maintained. This taller vegetation increases from 15 to 35 feet in height as the distance from the wires zone towards the outside of the corridor increases. The reduction in clearing and narrowing of the scrub-shrub area within the tapered corridor, and taller vegetation along the sides of the corridor, will substantially reduce the impacts on wildlife.

The Department recognizes much of the forested area around the proposed Segment 1 corridor is actively managed as commercial timberland. This contributes to the mosaic of different aged forest in the western Maine region. Private landowners who actively manage their land do so in response to market conditions and to achieve their individual objectives. As a result, it is not possible for the Department to predict the exact type of forested habitat that will exist along the entire Segment 1 corridor throughout the lifespan of the project. Tapering along Segment 1, however, will provide improved habitat and improved passage between areas of suitable habitat where and when they exist adjacent to the corridor. Tapering will avoid creation of a hard forest edge and help mitigate the

edge effect explained by Hunter in his testimony. A tapered corridor also will result in a narrower scrub-shrub opening closer to the width of a land management road, which testimony established is less fragmenting than a 150-foot wide cleared transmission corridor. This tapering will allow a greater opportunity for wildlife to cross the corridor and reduce the time/distance crossing wildlife would be out in the more open shrub-shrub habitat.

How the vegetation within the tapered areas along Segment 1 is managed will influence the environmental benefit of this form of mitigation. In updating its VCP and VMP as required by this Order, in addition to explaining how the tapered vegetation heights more fully described in Appendix C will be achieved, the applicant must describe how the vegetation will be managed to ensure tapering minimizes the environmental impact of the corridor to the greatest extent practicable, including reasonable efforts to avoid the growth of even-aged stands within each taper.

2. Taller Poles and Taller Vegetation

A tapered corridor helps minimize impacts to habitat and wildlife movement, but, by itself, does not adequately provide for the protection of wildlife throughout Segment 1 of the corridor. For example, Publicover testified “vegetation in the range of 30 to 40 feet would meet minimum height and density requirements for marten.” Simons-Legaard offered similar testimony regarding pine marten habitat and this umbrella species’ preference for habitat with trees at least 30 feet tall. Taller poles can allow for taller vegetation under the conductors. Additionally, in some locations taller vegetation may be feasible under the corridors simply as a result of taking advantage of existing topography.

The Department finds that additional protection for wildlife habitat and travel corridors can be provided by maintaining taller vegetation in the corridor, including in riparian areas and adjacent to conservation lands. Based on Department staff’s knowledge that wildlife utilize riparian areas as travel lanes, the Department finds that significant gains in protection can and must be made in such areas. Additionally, as Simons-Legaard testified, when evaluating where along the corridor to maintain taller vegetation, locations where mature forest in the areas abutting the corridor is most likely to remain should be targeted. Riparian areas and areas adjacent to conserved land are two such areas she noted. TNC identified nine areas where it suggested taller vegetation would benefit wildlife.

Department staff, in questions to CMP at the May 9, 2019 hearing, identified five areas (including nine stream or river crossings) where taller vegetation with a minimum height of 35 feet could be maintained due to existing topography with poles only minimally taller, or no taller, than proposed.³⁰

³⁰ These areas are: the South Branch Moose River crossing (structures 3006-768 to 3006-767), the crossing of a group of five unnamed streams (structures 3006-742 to 3006-741), unnamed stream crossing (structures 3006-589 to 3006-588), Tomhegan Stream crossing (structures 3006-576 to 3006-575), and Moxie Stream crossing (structures 3006-542 to 3006-541). Four of these five areas – South Branch of Moose River, the groups of five unnamed

In a May 17 submission, CMP agreed that this appeared feasible. Since the hearing, the Department has continued its review of the evidence in the record and identified additional areas where taller vegetation, with a minimum height of 35 feet, is appropriate to support wildlife and reasonably achievable in light of existing topography or by using taller poles in areas where the taller structures would not be visible from scenic resources, or any visual impacts would be minimal and not have an unreasonable adverse effect on scenic uses or character of the surrounding area.

In identifying areas where a minimum vegetation height of 35 feet must be maintained the Department focused on areas with stream crossings and areas adjacent to conserved land, and also considered the habitat connectivity priority areas identified by TNC. The identified areas with a required minimum vegetation height of 35 feet are listed in Appendix C and identified as Wildlife Areas 1 through 5 and 7 through 10 in Table C-1.³¹

In response to concerns about the potential impact of the project to Roaring Brook Mayfly and Northern Spring Salamander habitat, the applicant proposed to retain full canopy height vegetation at the Gold Brook and Mountain Brook crossings. The location of this taller vegetation also is listed in Appendix C, Table C-1. The Gold Brook crossing is part of the larger Wildlife Area 4. The Mountain Brook crossing is identified as Wildlife Area 6.

Finally, in response to concerns about potential impacts to DWAs the applicant proposed to provide 10 deer travel corridors within the Upper Kennebec River DWA. Two of the corridors would be adjacent to the Upper Kennebec River in the area where the transmission line would be underground, allowing retention of full canopy height vegetation. Eight of the travel corridors would be created by selectively cutting the corridor to promote softwood growth necessary to provide winter habitat for deer. This softwood vegetation would range in height from 25 to 35 feet. Both forms of vegetation management within the corridor are described more fully in Appendix C. In this same appendix, the locations of these travel corridors are listed. The two full canopy height travel corridors are identified as Wildlife Area 11. The eight softwood vegetation travel corridors managed specifically for deer, collectively, are identified as Wildlife Area 12.³²

Together, the areas along Segment 1 with full canopy height vegetation, vegetation with a 35-foot minimum height, and softwood vegetation managed for deer travel make up 12 Wildlife Areas.

streams, Tomhegan Stream and Moxie Stream – correspond with portions of the nine TNC-identified priority areas (numbers 2, 4, 8, and 9, respectively).

³¹ Wildlife Area 1 includes part of TNC area 1; Wildlife Area 2 includes all of TNC area 2; Wildlife Area 3 includes all of TNC area 3; Wildlife Area 4 includes part of TNC area 4; Wildlife Area 5 includes all of TNC area 5, plus several additional structures, including the crossing of an unnamed stream where 35-foot tall vegetation likely can be retained without taller poles (3006-708 to 3006-707); Wildlife Area 7 includes the crossing of Cold Stream; Wildlife Area 8 includes an unnamed stream crossing where 35-foot tall vegetation likely can be maintained without taller poles; Wildlife Area 9 includes Tomhegan Stream and part of TNC area 8; and Wildlife Area 10 crosses Moxie stream and is within TNC area 9.

³² Wildlife Area 11 and most of Wildlife Area 12 are within TNC area 9.

These Wildlife Areas, which total approximately 14.08 miles along the 53.1-mile-long Segment 1 corridor, will provide improved passage and connectivity across Segment 1, helping to protect wildlife, provide travel lanes between areas of habitat, and mitigate wildlife habitat impacts overall. The majority of these travel lanes will exceed 400 feet in width and benefit multiple species that prefer interior forest habitats, including pine marten.

3. Conservation

Tapering and maintaining taller vegetation, as required above, will help mitigate the impact of Segment 1 of the corridor on wildlife and wildlife habitat. The 53.1-mile section of corridor, however, still will have a fragmenting effect on the landscape of this unique forested region, affecting wildlife. For example, an approximately 54-foot wide cleared strip maintained as scrub-shrub habitat will run along much of Segment 1 and the edge effect and reduction in interior forest habitat impacts testified to by Hunter, will remain, although taller vegetation will reduce the edge effect. Additionally, even within areas with taller vegetation access ways will be required during construction and maintained as scrub-shrub habitat. Where the minimum vegetation height is 35 feet, some taller vegetation may need to be selectively cut if it would encroach into the conductor safety zone. The tapering and taller vegetation required by this Order help minimize the impacts associated with fragmentation; they do not eliminate them. The proposed corridor will not provide habitat for interior forest species such as the pine martin and there remains an edge effect created by access roads even in areas with taller vegetation. The shorter vegetation in the wire zone of the tapered areas creates an edge effect as well.

Because of the impacts to wildlife, even with on-site mitigation, the Department finds additional, off-site, mitigation in the form of land conservation is required to ensure the applicant has made adequate provision for the protection of wildlife in the region affected by the project.

TNC advocated through its witness testimony and post-hearing brief that conservation in the range of 40,000 to 100,000 acres would be necessary to mitigate for habitat fragmentation impacts. TNC estimates that approximately 5,000 acres would be impacted by the corridor itself and associated edge effect, assuming an edge effect width of 330 feet. While this 5,000-acre calculation of impact pre-dates the slightly shorter Merrill Strip Alternative and was made without knowing taller vegetation would be required in some areas, the Department finds this estimated area of impact remains a reasonable baseline for evaluating the appropriate amount of additional conservation that should be required. This is based on the fact that even with tapering and taller vegetation, Segment 1 will have an impact on wildlife for which mitigation is required. Factoring in the other forms of mitigation required in this Order, the Department finds a 20:1 ratio, which would yield approximately 100,000 acres of conservation, or even a 10:1 ratio, unreasonably high. In evaluating other environmental impacts and allowing for off-site preservation as

mitigation of those impacts, the Department commonly applies an 8:1 ratio³³ and finds that that ratio and resulting conservation, 40,000 acres, is reasonable and appropriate here to ensure the applicant has made adequate provision for the protection of wildlife.

Within 18 months of the date of this Order, CMP must develop and submit to the Department for review and approval a plan (the Conservation Plan) to permanently conserve 40,000 acres in the vicinity of Segment 1. The Conservation Plan must:

- Establish as its primary goal the compensation for the fragmenting effect of the transmission line on habitat in the region of Segment 1 and the related edge effect by promoting habitat connectivity and conservation of mature forest areas;
- Identify the area(s), with a focus on large habitat blocks, to be conserved and explain the conservation value of this land; any conservation area must be at least 5,000 acres unless the area is adjacent to existing conserved land or the applicant demonstrates that the conservation of any smaller block, based on its location and other characteristics, is uniquely appropriate to further the goals of the Conservation Plan;
- Include a draft forest management plan establishing how, consistent with the primary goal of the Conservation Plan, the conservation area(s) will be managed, including to provide blocks of habitat for species preferring mature forest habitat and wildlife travel corridors along riparian areas and between mature forest habitat;
- Explain the legal interest, such as fee ownership or a working forest conservation easement, that will be acquired in each area; the proposed owner or holder of this interest; and the qualifications of each proposed owner or holder;
- Include preliminary consent from any proposed owner or holder;
- Explain how the applicant will ensure the availability stewardship funding (e.g., funding for monitoring and enforcement) needed to support achievement of the goals of the Conservation Plan; and
- Ensure the Department will have third party enforcement rights.

Prior to commercial operation of the project, the approved Conservation Plan must be fully implemented, unless, upon a showing by the applicant that it has made reasonable, good faith efforts to implement the Conservation Plan and addition time, not more than four years from the date of this Order, is needed, the Department approves an extension of the implementation deadline. Prior to implementation, all forest management plans, and all conservation easements, deed restrictions, covenants, or other legal instruments designed to fulfill the objectives of the Conservation Plan, must be submitted to the Department for review and approval.

³³ See, e.g., Ch. 310, § 5(C)(5)(c) (requiring an 8:1 ratio for compensation for wetlands impacts) and Ch. 335, § 3(D)(3)(b) (requiring an 8:1 ratio for compensation for SWH impacts).

4. Summary

The combination of vegetation management proposed by CMP and the additional requirements imposed as conditions of this Order, which include tapering and maintenance of taller vegetation, will reduce habitat impacts, provide wildlife sufficient ability to move between suitable habitats, regardless of where adjacent to the corridor this habitat changes as forestry patterns shift. Furthermore, the landscape-scale wildlife habitat impacts associated with fragmentation that will occur, even with this vegetation management, will not be unreasonable, given that they will be mitigated and offset through the required additional conservation within the western Maine forest area in which Segment 1 is located. Provided the applicant implements these measures, the Department finds that the project will result in adequate provision for the protection of wildlife.³⁴

b. Significant Vernal Pools and Other Significant Wildlife Habitat

Significant wildlife habitat is a statutorily defined term and, of particular relevance in review of present project, includes significant vernal pool habitat and high and moderate value waterfowl and wading bird habitat. 38 M.R.S. § 480-B(10). Which vernal pools and surrounding habitat qualify as a SVP is based on the criteria in Chapter 335, § 9³⁵; what habitat qualifies as an IWWH and TWWH is specified in Chapter 335, § 10.

As discussed in more detail above, the applicant's project will impact 61 SVPs, including 1.46 acres of permanent fill in the critical terrestrial habitat, 27.57 acres of clearing in uplands, and 3.68 acres of clearing forested wetlands; 16 IWWHs, including 15.03 acres of impact, all but 0.003 acres of which is from clearing; and one TWWH.

NRPA, in 38 M.R.S. § 480-D(3), requires the applicant to demonstrate that the proposed project will not unreasonably harm significant wildlife habitat. Site Law also regulates impacts to natural resources, 38 M.R.S. § 484(3), with the Site Law rule Chapter 375, § 15(B) specifically identifying significant vernal pools and high and moderate value waterfowl and wading bird habitat, among the habitats important to protecting wildlife.

Chapter 335 interprets and elaborates on the NRPA criteria for obtaining a permit. The rules guide the Department in its determination of whether a project's impacts would be unreasonable. A proposed project would generally be found to be unreasonable if it would degrade the significant wildlife habitat, disturb the subject wildlife, or affect the continued use of the significant wildlife habitat by the subject wildlife, either during or as a result of the activity, and there is a practicable alternative to the project that would be

³⁴ The vegetation management required by this Order, including as identified in Appendix C, is integral to the Department's decision and necessary to ensure the project does not violate applicable statutory or regulatory standards.

³⁵ Dr. Calhoun testified about vernal poolscapes and advocated for the regulation of these in the same manner as significant vernal pools. Where a vernal pool that is part of a poolscape qualifies as a significant vernal pool, this pool is regulated as such under Chapter 335. Vernal pools that do not meet the definition of significant are regulated under NRPA as wetlands pursuant to Chapter 310.

less damaging to the environment. As discussed above, the Department has reviewed project alternatives and finds there is no practicable alternative to the project that would be less damaging to the environment.

Chapter 335 requires that the amount of habitat to be altered and the disturbance of the subject wildlife must be kept to the minimum amount necessary for meeting the overall purpose of the project. The Department finds that within the corridor and at associated substations, the applicant has designed the project to minimize impacts to significant wildlife habitat, for example, through the selection of pole locations and siting of access roads. Also, the applicant's Vegetation Construction Plan (VCP) and Vegetation Management Plan (VMP) establish:

- Protected natural resources³⁶ and their associated buffers will be flagged or located using a Global Positioning System (GPS) prior to all construction and maintenance activities;
- Initial clearing within SVP habitat will take place during frozen ground conditions, if practicable. If not practicable, clearing will be accomplished using hand tools or reach-in techniques. If required to remove vegetation, any travel lanes within the SVP habitat must be approved by the Department;
- During routine maintenance, between April 1 and June 30 in any calendar year, no vegetation will be removed using tracked or wheeled equipment in SVP habitat;
- No mechanized equipment will be used within IWWH between April 15 and July 15 in any calendar year;
- Herbicide will not be applied within 25 feet of any IWWH;³⁷ and
- Provided they do not pose a safety hazard, naturally occurring snags within IWWH will be allowed to remain, at a minimum of two to three snags per acre.

In accordance with Chapter 335, § 3(D)(1), if an impact to significant wildlife habitat will cause habitat functions or values to be lost or degraded, compensation is required to achieve the goal of no net loss of significant wildlife habitat functions and values. The applicant proposes to make a contribution into the In-Lieu Fee (ILF) program of the Maine Natural Resource Conservation Program in the amount of \$623,657.53 to compensate for SVP impacts and \$253,352.53 to compensate for IWWH impacts. Prior to the start of construction, the applicant must submit a payment in the amount of \$877,010.06 payable to "Treasurer, State of Maine", and directed to the attention of the ILF Program Administrator at 17 State House Station, Augusta, Maine 04333. (See Appendix F.)

The Department finds that the applicant has avoided and minimized Significant Wildlife Habitat impacts to the greatest extent practicable, and that, with the compensation that will be achieved through the ILF payment, the proposed project represents the least

³⁶ Protected natural resources include rivers, streams, brooks, SVP, IWWH, coastal wetlands, and habitats for threatened, or endangered species.

³⁷ Within Segment 1, CMP will not use any herbicide at all.

environmentally damaging alternative that meets the overall purpose of the project, provided the applicant:

- Submits an In-Lieu Fee payment to the Department for the Maine Natural Resource Conservation Program in the amount of \$877,010.06 prior to the start of construction (See Appendix F, Table F-1.)

The Department further finds that the activity will not unreasonably harm or disturb any significant vernal pool habitat or other Significant Wildlife Habitat, including high and moderate value waterfowl and wading bird habitat, provided the applicant:

- Marks the location of all natural resource buffers with flagging prior to the start of construction;
- Permanently marks all natural resource buffers upon completion of construction; and
- Marks all natural resource buffers with flagging prior to any maintenance activities.

c. Brook Trout and Coldwater Fisheries

The project corridor crosses 471 rivers, streams, or brooks that contain brook trout habitat, 351 of which will have clearing impacts, and five Outstanding River Segments. Maine is one of the last places where native brook trout habitat is still intact and wild brook trout still thrive. This fishery and the related use of the resource by fishing guides, owners of sporting camps, and Maine residents and tourists are an important use of the resource involving many communities in the area near the project. While Brook trout habitat is not among the habitats protected in NRPA as Significant Wildlife Habitat, the impacts of a proposed project on the functions and values of rivers, streams and brooks, as set forth in Chapter 310, § 5(D)(b), is a factor in the determination of whether the proposal would have an unreasonable impact on the protected resource. Fisheries, aquatic habitat, and wildlife habitat are listed among the functions to be considered. Chapter 310, § 3(J). In addition, impacts to brook trout from activities that may adversely affect fisheries lifecycles and general impacts to waterbodies that serve as brook trout habitat are considered by the Department under Site Law, 38 M.R.S. § 484(3), and Chapter 375 §15. As a result, to obtain approval for a proposed project under NRPA and Site Law an applicant must make adequate provision for the protection of fisheries and avoid, minimize, and compensate for impacts to fish habitat.

As discussed above, the Department has reviewed project alternatives and finds there is no practicable alternative to the project that would be less damaging to the environment. As the project has evolved through the permit review process, the applicant has taken steps to minimize the impact of the project on brook trout and coldwater fisheries. The applicant has committed to:

- Increase the riparian filter areas (buffers) along streams crossed by the project from the 25 feet originally proposed to 100 feet around all perennial streams in

Segment 1, all coldwater fisheries streams in all segments, all Outstanding River Segments, and all streams containing threatened or endangered species. A complete list of all rivers, streams and brooks that are crossed by the project and their fisheries status is attached as Appendix E.

- Conserve the Grand Falls Tract, Basin Tract, and Lower Enchanted Tract, which contain 12.02 miles of streams combined. These tracts also contain frontage on Dead River, an Outstanding River Segment.

Where a 100-foot riparian filter area will be maintained along streams, capable species (vegetation capable of growing tall enough to reach into the conductor safety zone) will be removed using hand tools or reach-in techniques. (See Appendix C for a summary of riparian filter areas.) No herbicides will be used within these riparian filter areas.³⁸ Inside the wire zone all capable woody vegetation will be removed down to ground level. Outside the wire zone non-capable species will be allowed to exceed ten feet in height if it is determined the specimens will not encroach into the conductor safety zone.

In addition, as noted above in the discussion of habitat fragmentation, CMP proposed to allow full canopy vegetation at Gold and Mountain brooks and is required to maintain taller vegetation with a minimum height of 35 feet in additional Wildlife Areas, which also are listed in Appendix C of this Order and include the crossing of numerous coldwater streams. The Department finds that this full canopy and taller vegetation will minimize the impacts of habitat fragmentation, and the taller vegetation at these crossings will benefit brook trout by providing shading, buffering runoff, and providing large woody debris to the streams. In areas where tapering or vegetation with a minimum height of 35 feet is required, the applicant must leave trees that have been cut during routine maintenance unless it would be violation of the Slash Law or create a fire or safety hazard. This will provide for large woody debris imports into the streams, which helps create pools and provides nutrients and more closely mimics natural forest succession.

Finally, in the course of the permitting process CMP proposed, as part of its compensation for impacts to coldwater fisheries, to provide \$200,000 to fund culvert replacements in order to improve fish passage. CMP estimated this funding would be sufficient to implement 20 to 25 culvert replacements. The Department agrees with CMP that replacing 25 culverts, when viewed in light of the mitigation and conservation noted above, would adequately compensate for project impacts to coldwater fisheries. However, the Department finds the proposed \$200,000 insufficient to provide this level of compensation.

The Department recently awarded grants to numerous municipalities to install Stream Smart crossings in public roads. The average grant award was approximately \$87,000 and was matched by the municipality or other funding sources in order to fully fund the replacement.

³⁸ Additionally, no herbicide use will be allowed anywhere in the Segment 1 corridor.

Many of the culverts that may be replaced by the funding proposed by CMP would not be located under town roads and, therefore, would be less expensive to construct. However, based on Department experience and intervenors' witness testimony, sufficiently improved crossings will cost substantially more than \$10,000 each. The Department finds the Reardon testimony on culvert replacement costs to be credible. He stated that the cost to construct a proper culvert crossing is in the range of \$50,000 to \$100,000, depending on the type of crossing. Assuming an average cost of \$75,000, the Department finds that replacing approximately 25 culverts would require \$1,875,000 in funding.

Prior to the start of construction, CMP must establish an escrow account, secure an irrevocable letter of credit, or otherwise provide a financial guarantee acceptable to the Department, to fund \$1,875,000 of culvert replacements. Prior to commercial operation of the project, the applicant must submit a plan to the Department for review and approval that establishes the locations of the culvert replacements and how the funds will be disbursed. The culverts to be replaced must be in the vicinity of Segments 1 or 2, must completely or partially block fish passage, must be replaced with crossings consistent with Stream Smart³⁹ principles, and must be selected to provide the greatest possible habitat benefit. CMP must document each culvert replacement, monitor those replacements for one year from the date of replacement, and submit a summary report to the Department for review within eighteen months of the date of the last replacement.

The Department finds the applicant has minimized impacts to waterbodies that serve as fisheries habitat to the greatest extent practicable, that the project will not unreasonably harm any aquatic habitat or fisheries, and that the applicant has made adequate provision for the protection of fisheries, provided the applicant:

- Conserves the Grand Falls Tract, Basin Tract, and Lower Enchanted Tract;
- Implements the vegetation management outlined in Appendix C; and
- Funds and implements \$1,875,000 of culvert replacements, and reports on the culvert replacement program, as required in this section.

See Appendix F for a list of compensation requirements.

d. Deer Wintering Areas

Impacts to deer wintering areas that have been designated as high or moderate value are reviewed under both NRPA as significant wildlife habitat pursuant to 38 M.R.S. § 480-B(10), and Site Law pursuant to Chapter 375, § 15(B)(3)(a).

³⁹ Stream Smart principles were developed to design road crossings of streams in a manner that allows for fish and aquatic organism passage while maintaining a safe, reliable road. Stream smart crossings typically involve either an open-bottom arch crossing or a culvert that is large enough to be embedded in the stream bottom.

The project is proposed to cross 22 DWAs, including 39.02 acres of impact to the Upper Kennebec River DWA. None of the impacted DWAs have been rated by MDIFW as high or moderate value.

Although they have not been rated by MDIFW as high or moderate value, credible witness testimony from Joseph established the recent challenges for the deer population and the habitat value of these DWAs. CMP also recognizes their value, and following discussions with MDIFW, agreed to offset impacts to the Upper Kennebec River DWA by:

- Providing 10 travel corridors within this DWA. Eight of the travel corridors would be created by selectively cutting the corridor to promote softwood growth necessary to provide winter habitat for deer (see Appendix C, Table C-1); two of these corridors would be adjacent to the Upper Kennebec River in the area where the transmission line would be underground, allowing retention of full canopy height vegetation; and
- Preserving 717 acres of land within this DWA (see Appendix F, Table F-2).

These actions reduce wildlife impacts and promote the protection of wildlife generally, but especially deer, and will provide travel lanes for deer between available DWA habitat. These measures, together with the conditions contained in this Order, ensure the Project will not unreasonably impact significant wildlife habitat.

e. Threatened and Endangered Species Habitat

The project is located in or near the habitat for 10 species included on the Maine's Endangered or Threatened species list. An applicant must make adequate provision for the protection of wildlife and this includes ensuring no unreasonable disturbance to the habitat of species listed as threatened or endangered. Chapter 375, § 15(B).

During the application review process, CMP gathered additional information and adjusted its proposal to minimize impacts to threatened or endangered species and their habitat in response to questions and concerns raised by MDIFW. CMP also proposed to compensate for these impacts.

CMP has committed to the following impact minimization efforts:

- Preserving full height canopy at the Gold Brook and Mountain Brook crossings, crossings where NSS and RBM habitat is present;
- Limiting construction activities in mapped habitat for wood turtles to between October 15 and April 15 (prohibiting construction between April 16 and October 14);
- Limiting construction activities in mapped habitat for Rusty Black Birds to between June 1 and April 19 (prohibiting construction between April 20 and June 30); and

- Completing a survey for Great Blue Heron colonies within or immediately adjacent to existing IWWH between April 20 and May 31, and prior to initial transmission line clearing (consultation with MDIFW and possible modifications to the proposed project would follow the identification of any colony).

To compensate for impacts, CMP has proposed to:

- Contribute \$469,771.95 to Maine's Endangered and Nongame Wildlife Fund for impacts to NSS and RBM habitat; and
- Contribute \$180,000 to Maine's Endangered and Nongame Wildlife Fund for impacts associated with 11.02 miles of forested conversion in riparian buffers.

Provided CMP implements the steps outlined above, the Department finds the applicant has made adequate provision for the protection of threatened or endangered species. (See Appendix F for a list of compensation requirements.)

f. Wetlands and Waterbodies

The applicant proposes to directly alter 4.12 acres of wetland and indirectly impact 105.25 acres of wetland to construct the proposed project. The direct impacts include construction of the Merrill Road Converter Station, the Fickett Road Substation, filling and grading for structure placement, and the installation of foundations for structures. Some of the wetlands are considered wetlands of special significance.⁴⁰ In addition, the transmission line will cross 674 rivers, streams, or brooks, 131 of which will have no additional clearing. Rivers, streams, and brooks that serve as brook trout habitat also are discussed above in subsection c.

As discussed above the applicant submitted an alternatives analysis for the project and the Department finds the proposed project route is the least environmentally damaging practicable alternative.

The Department further finds that the alteration of the wetlands will be kept to the minimum amount necessary for meeting the overall purpose of the project. For example, the applicant's project is designed to locate poles and roads outside wetlands when possible and the applicant proposes to maintain 100-foot riparian filter areas (buffers) on all perennial streams in Segment 1, all Outstanding River Segments, and on all coldwater fisheries streams, and to maintain 75-foot riparian filter areas (buffers) on all other streams. Within these riparian filter areas, and throughout the Segment 1 corridor, no herbicides will be used. Additionally, as specified in the VCP, any work in freshwater wetlands will occur on construction mats unless the area is frozen or the Department approves another method.

⁴⁰ As specified in Chapter 310, § 5-A(1)(b), construction of utility lines is one of the types of activities for which a permit may be sought for a project proposed to impact a wetland of special significance, subject to there being no practicable alternative to the activity that would be less damaging to the environment.

In accordance with Chapter 310, § 5(C), compensation may be required to achieve the goal of no net loss of coastal wetland functions and values. The applicant proposes to preserve 1,022.4 acres of land in three separate parcels (Little Jimmy Pond Tract, Flagstaff Lake Tract, and Pooler Pond Tract), which contain 510.75 acres of wetland. The applicant proposes to use the Department's Declaration of Covenants and Restrictions to preserve these parcels.

The Department finds that the applicant has avoided and minimized freshwater wetland and waterbody impacts to the greatest extent practicable, and that the proposed project represents the least environmentally damaging alternative that meets the overall purpose of the project, provided the applicant:

- Preserves the Little Jimmy Pond Tract, the Flagstaff Lake Tract and the Pooler Pond Tract, as described above. (See Appendix F for a list of compensation requirements.)

(3) Unusual Natural Areas

In Chapter 375, § 12, the Department recognizes the importance of protection of unusual natural areas, including rare botanical communities or plants. As noted above, the applicant has identified 15 rare plant occurrences and five unique natural communities in or adjacent to the corridor. The applicant has discussed these occurrences and communities with the MNAP and, among other things, agreed to redesign a section of the proposed transmission line to avoid impacts to nearby whorled pogonia and to maintain a riparian buffer to minimize impacts to Goldie's Wood Fern. The applicant's VCP and VCM also take into account rare plant locations; herbicides will not be used in these areas and, mechanized equipment will only be allowed to cross these locations if the rare plant locations encompass the entire corridor and in such an instance the crossing will only occur during frozen conditions, on existing travel paths, or with the use of mats.⁴¹ The Department finds the applicant has avoided and minimized impacts to these natural areas to the extent practicable. In response to comments from MNAP suggesting compensation for impacts the applicant revised the compensation plan. This revised plan includes a contribution to the Maine Natural Areas Compensation Fund for impacts to Goldie's Wood Fern and the Jack Pine Forest. The compensation plan requires the applicant to make a contribution to this fund in the amount of \$1,234,526.82.

The Department finds that the proposed development will not have an adverse effect on unusual natural areas either on or near the development site, provided the applicant:

- Contributes \$1,234,526.82 to the Maine Natural Areas Compensation Fund prior to the start of construction. (See Appendix F, Table F-2.)

⁴¹ The VCP establishes that prior to construction the applicant will identify any invasive plant species within the corridor and submit to the Department for review and approval, a vegetation monitoring plan. The objective of the plan would be prevention of the introduction or spreading of invasive species as a result of construction.

(4) Overall Findings Regarding Natural Resource Impacts

Upon review of the administrative record, including the application materials, hearing testimony and exhibits, agency comments, and written public comments, the Department has considered whether the applicant has met its burden of proof on the criteria pertaining to the natural resource impacts of the project. The potential impacts of most significance and that generated the most testimony and public comment are discussed in more detail above. Having completed its review and evaluation, the Department finds that the applicant has avoided and minimized natural resource impacts to the greatest extent practicable, and that the proposed project represents the least environmentally damaging alternative that meets the overall purpose of the project, provided the applicant meets the requirements summarized below and discussed more fully in Section 7 of this Order.

The Department finds that the applicant has made adequate provision for the protection of wildlife and fisheries, unusual natural areas, significant wildlife habitat, and freshwater wetlands, provided the applicant:

- Maintains taller vegetation within the Segment 1 corridor as outlined in Appendix C, including by:
 - Maintaining full canopy height vegetation in the locations identified in Table C-1,
 - Maintaining vegetation with a minimum height of 35 feet in the locations identified in Table C-1,
 - Maintaining deer travel corridors in the locations identified in Table C-1, and
 - Maintaining tapered vegetation along the entire Segment 1 corridor, except where full canopy height vegetation, vegetation with a minimum height of 35 feet, or taller vegetation managed for deer travel corridors is required;
- Leaves trees that have been cut during routine maintenance in areas where tapering or vegetation with a minimum height of 35 feet is required, unless doing so would violate the Slash Law or create a fire or safety hazard;
- Maintains 100-foot riparian filter areas along all perennial streams in Segment 1, all coldwater fisheries streams in all project segments as identified in Appendix E, all streams containing threatened or endangered species, and all Outstanding River Segments; and maintains 75-foot riparian filter areas on all other streams;
- Conserves the Basin Tract, Lower Enchanted Tract, and Grand Falls Tract, which together include 1,053.5 acres of land and 12.02 linear miles of stream;
- Conserves the Little Jimmy Pond Tract, Flagstaff Lake Tract, and Pooler Pond Tract, which together include 510.75 acres of wetland and 1,022.4 acres of land area;
- Conserves 717 acres of land within the Upper Kennebec River DWA and provides 10 travel corridors within this DWA consistent with Appendix C;
- Limits construction activities in mapped habitat for wood turtles to between October 15 and April 15 (prohibiting construction between April 16 and October

- 14) in any calendar year, unless CMP follows the measures described in its July 13, 2018 Response to MDIFW March 15, 2018 Environmental Review comments;
- Limits construction activities in mapped habitat for Rusty Black Birds to between July 1 and April 19 (prohibiting construction between April 20 and June 30) in any calendar year;
 - Maintains 10-15-foot tall spruce/fir vegetation in the mapped Rusty Black Bird habitat;
 - Completes a survey for Great Blue Heron colonies within or immediately adjacent to existing IWWH between April 20 and May 31, and prior to initial transmission line clearing; if any colonies are identified, the applicant must consult with MDIFW and obtain approval from the Department prior to construction in the vicinity of any colony;
 - Marks the location of all natural resource buffers with flagging prior to the start of construction;
 - Permanently marks all natural resource buffers upon completion of construction;
 - Marks all natural resource buffers with flagging prior to any maintenance activities;
 - Updates its VCP and VMP to be consistent with the requirements of this Order, including but not limited to vegetation management requirements in Appendix C, and submits the updated plans to the Department for review and approval prior to the start of construction (which includes clearing) within the corridor;
 - Contributes, prior to the start of construction:
 - A total of \$877,010.06 to the ILF program for unavoidable impacts to SVPs (\$623,657.53) and IWWHs (\$253,352.53), and
 - A total of \$649,771.95 to Maine Endangered and Nongame Fund for impacts to RBM and NSS (\$469,771.95) and riparian buffers (\$180,000.00);
 - Ensures \$1,875,000 of funding to replace culverts as described above; and
 - Within 18 months of the date of this Order, develops and submits to the Department for review and approval a Conservation Plan, consistent with Section 7(D)(2)(a)(3), to permanently conserve 40,000 acres in the vicinity of Segment 1. Prior to commercial operation of the project, the approved Conservation Plan must be fully implemented, unless, upon a showing by the applicant that it has made reasonable, good faith efforts to implement the Conservation Plan and additional time, not more than four years from the date of this Order, is needed, the Department approves an extension of the implementation deadline. Prior to implementation, all forest management plans, and all conservation easements, deed restrictions, covenants, or other legal instruments designed to fulfill the objectives of the Conservation Plan, must be submitted to the Department for review and approval.

The Department finds that the proposed development will not have an adverse effect on unusual natural areas either on or near the development site, provided the applicant:

- Contributes, prior to the start of construction, \$1,234,526.82 to the Maine Natural Areas Conservation Fund for impacts to Goldie's Wood Fern and the Jack Pine Forest.

8. HISTORIC SITES

The Department recognizes the value of preserving sites of historic significance and, pursuant to Chapter 375, § 11(C), considers whether a proposed development will have an adverse effect on the preservation of historic sites either on or near the development site.

The applicant evaluated the project impacts to archeological sites within the right-of-way (ROW) and to architectural resources within a half mile of the project centerline. As part of its review of potential impacts to archeological sites the applicant conducted a Phase I archeological survey. This survey was prepared and updated by the applicant in consultation with the Maine Historic Preservation Commission (MHPC). As part of this survey, which included both desktop analysis and field work, the applicant identified sensitive areas where archaeological sites were likely and conducted shovel tests at 4,537 locations. There were 440 positive shovel tests, which identified 47 archaeological resources, including 29 archaeological sites and 18 isolated finds. The applicant found that the 18 isolated finds were not eligible for National Register of Historic Places (NRHP) listing. The 29 archaeological sites, plus 16 previously recorded sites, produced a total of 45 such sites within the ROW. The applicant focused further analysis on the 29 previously unidentified sites, finding that 28 are historic and one is prehistoric. The applicant recommended 14 sites as not eligible for NRHP listing and identified one as potentially extending beyond the ROW, but not containing significant deposits within the ROW. For the remaining sites the applicant opted for avoidance because of their potential significance. The applicant noted seven of the 14 may potentially be impacted by the project and offered a treatment plan for these seven sites. With the proposed treatment the applicant concluded there would be no adverse effect on these sites. Other sites would not be adversely affected as they would not be impacted at all.

MHPC reviewed the Phase I archeological report and on February 11, 2019, issued comments concurring with the final report and report recommendations. MHPC stated that plans for site avoidance, treatments, and site monitoring during and after construction should be detailed in a project memorandum of agreement between the applicant and MHPC.

The Department finds the Phase I archeological report is thorough and informative, and the measures proposed by the applicant to avoid and minimize any impact to archeological resources reasonable and appropriate. The Department finds that the proposed development will not have an adverse effect on the preservation of historic archeological resources, provided the applicant:

- Implements the plans for site avoidance and treatments described in the final Phase I archaeological survey report.

With regard to architectural resources, the applicant conducted an above ground resources survey in which it identified over 1,500 historic resources within a half mile of the project.

The applicant identified which of these resources were listed or already recommended for listing on the NRHP, as well as those which it recommended as eligible for listing. The applicant prepared its above ground resources survey in consultation with MHPC, responding to MHPC comments throughout the survey process. The applicant identified historic resources that could be adversely affected by the project and proposed mitigation measures. MHPC agreed with the survey methods and largely agreed with the applicant's conclusions. Ultimately, of all the historic resources identified, MHPC determined, in letters dated January 18 and March 26, 2019, the project will have an adverse effect on five:

- Farmstead at 1195 Hilton Hill (Anson) Road, Starks (SM#s 1014-1020)
- Farmstead at 1294 Hilton Hill (Anson) Road, Starks (SM#s 1022-1033)
- Barn at 40 Turmel Road, Livermore Falls (SM# 795)
- Bowman Airfield, River Road, Livermore Falls (SM# 719)
- Appalachian Trail, near Troutdale Road, Bald Mountain Twp. (SM# 66)

MHPC's determination was based on Section 106 of the National Historic Preservation Act and accompanying federal regulations defining adverse effect. Based on its determination, MHPC requested that the federal permitting agency, the U.S. Army Corps of Engineers enter into a memorandum of agreement with MHPC.

The Department finds the comments provided by MHPC informative, while recognizing they are focused on a separate federal review process. For those historic resources where the applicant's analysis and the assessment of MHPC are in agreement that the project will not have an adverse effect, the Department finds the project will not have an adverse effect on the preservation of these historic properties. For the remaining five historic resources, the federal process resulting in a determination of adverse effect by MHPC, under the federal definition of that term, does not mandate a conclusion that the impacts are unreasonable under the Site Law. Where MHPC makes such a determination, however, the Department finds closer scrutiny of the impacts is warranted.

With regard to the two farmsteads, the barn, and airfield the Department finds the impact of the project on these historic properties would be indirect. The structures and the airfield themselves would not be impacted, but the setting in which they are located would be affected. The Department finds, however, that this impact would not affect the preservation of these historic properties, nor would the impact be unreasonable. Factors the Department considered include that the project at each of these sites is being co-located with existing transmission lines and the long-standing presence of these existing lines in the setting of these historic properties. Research provided by the applicant shows a transmission line has been part of the barn's setting for nearly eighty years, with two transmission lines present for over 50 years. Similarly, the existing transmission line has been a part of the setting of two farmsteads since approximately 1930.

With regard to the airfield, it was established in the 1960s, with hangers ranging in age from the 1960s to the 1990s. An initial transmission line was constructed in 1930, well before the establishment of the airfield, with a second line added in approximately 2012.

The crossing of the Appalachian Trail (AT) is discussed above as part of the Department's review of the scenic impacts of the project. In addition to being a scenic resource, the AT also is a historic resource. In evaluating the impact of the project under Chapter 375, § 11(C), the Department finds the history of the trail in this area of Troutdale Road important. The transmission line corridor, which is currently developed with a transmission line, predates the trail in the location of the present crossing. The corridor was developed with a transmission line in the 1950s; the AT was rerouted and crossed the corridor in its present location in the 1980s. The project will increase the cleared width of the existing corridor and include taller poles, increasing visibility of transmission infrastructure within the setting of the AT. The Department finds, however, that this impact will not affect the preservation of the AT, nor will the impact of the co-located line within a pre-existing transmission line right of way be unreasonable.⁴²

In sum, the Department finds that the proposed development will not have an adverse effect on the preservation of any historic sites either on or near the development site, provided the applicant:

- Implements the plans for site avoidance and treatments described in the final Phase I archaeological survey report.

9 BUFFER STRIPS

Natural buffer strips play an important role in protecting water quality and wildlife habitat. Buffer strips also provide screening that can serve to lessen the visual impact of incompatible or undesirable land uses. Pursuant to Chapter 375, § 9, an applicant must demonstrate that it has made adequate provision for buffer strips where appropriate. When evaluating whether an applicant has made adequate provision for buffers, the Department considers all relevant evidence, including evidence that:

- Water bodies within or adjacent to the development will be adequately protected from sedimentation and surface runoff by buffer strips;
- Buffer strips will provide adequate space for movement of wildlife between important habitats; and
- Buffer strips will shield adjacent uses from unsightly developments and lighting. (Ch. 375, § 9(B).)

⁴² CMP has stated it “has agreed with [Maine Appalachian Trail Club] that CMP will pay to re-locate the trail to an alignment farther to the southwest where the trail currently parallels the CMP corridor south of the Baker Stream Crossing” and that “CMP’s long-term goal is to secure a permanent re-route acceptable to both MATC and [the National Park Service], and CMP is willing to commit the necessary funds to this end.” (May 7, 2019, Letter from M. Manahan on Behalf of CMP to the Department regarding “NECEC – Preservation of Historic Sites.”) While the Department does not find re-routing the AT is necessary to satisfy the permitting standards addressed in this Order, the Department acknowledges this commitment by CMP.

A. Overview

The applicant submitted a Vegetation Clearing Plan (VCP) that describes the methods it proposed to be used to initially clear the ROW and a Vegetation Management Plan (VMP) that describes the methods it proposed to be used to maintain the vegetation in the ROW. These plans specify the types and heights of vegetation the applicant proposed to be maintained as buffers around various resources. To protect water bodies crossed by the corridor, the applicant initially proposed to maintain a 25-foot wide buffer strip adjacent to rivers, streams, and brooks where all woody vegetation would be removed from the wire zone, and proposed that outside the wire zone all capable species would be removed. In response to comments from both MDIFW and the Department, the applicant revised the VCP and the VMP to specify that it would maintain a 100-foot buffer around all coldwater fisheries streams, all perennial streams within Segment 1, all streams containing threatened or endangered species, and Outstanding River Segments and a 75-foot buffer adjacent to all other rivers, streams, and brooks. In these buffers all capable woody vegetation in the wire zone would be cut during initial clearing. Outside the wire zone, non-capable species would be allowed to grow after initial clearing if it is determined the specimens would not grow into the conductor zone prior to the next scheduled maintenance. These proposed buffers, referred to as riparian filter areas in this Order, are described more fully in Appendix C.

The VCP and VMP contain additional provisions that buffer resources beyond river, streams, and brooks. For example, when terrain conditions permit capable vegetation will be permitted to grow within and adjacent to protected natural resources or critical habitats where maximum growing height can be expected to remain well below the conductor safety zone.

In addition, the applicant proposed vegetation management intended to protect certain habitat and to facilitate wildlife movement. Specifically, the applicant proposed to maintain full canopy height vegetation at the Gold Brook and Mountain Brook crossings for the protection of Roaring Brook Mayfly and Northern Spring Salamander. Within the Upper Kennebec River DWA, the applicant also proposed to maintain taller softwood stands to create eight deer travel corridors, and to retain full canopy height vegetation along both sides of the river to preserve two additional travel corridors.

The applicant proposed additional buffering to serve as screening to minimize the visual impacts of the project, including tapering vegetation in 2.2 miles of the corridor visible from Coburn Mountain and planting screening vegetation at the Fickett Road Substation and certain road crossings, such as along the Old Canada Road (Route 201) in Johnson Mountain Township and Moscow and at the Troutdale Road.

The applicant also proposed no herbicide use, mixing, or transfer within 100 feet of private wells or 200 feet of public wells, identified by the applicant.

B. Department Analysis, Findings, and Conclusions

The Department has evaluated the applicant's proposal and the evidence related to buffers. With regard to the protection of waterbodies from sedimentation and surface runoff, the Department finds the project will be set back from great ponds, except for a short section of Segment 2 where the co-located corridor crosses Moxie Pond. The setbacks from great ponds (except Moxie Pond) serve as an adequate buffer. The Department further finds that the increased riparian filter areas (buffers) – 100 feet on all streams in Segment 1, all Outstanding River Segments, all streams containing threatened or endangered species, and on coldwater streams along the entire corridor; and 75 feet on all other crossings – will adequately protect rivers, streams, and brooks crossed by the project. In the area adjacent to Moxie Pond in Segment 2, the applicant must construct and maintain the project with a 100-foot riparian filter area identical to the riparian filter areas adjacent to coldwater fishery streams in Segment 1.

With regard to wildlife, the potential impact of the project on wildlife, wildlife movement, and habitat connectivity are evaluated in Section 7 of this Order. While the applicant proposed full canopy height vegetation at Gold and Mountain brooks, and adjacent to the Upper Kennebec River, along with eight additional deer travel corridors in the Upper Kennebec River DWA, these measures, by themselves, are insufficient to protect wildlife and adequately provide for wildlife movement. This is discussed more fully in Section 7. As a condition of this Order, a total of 12 Wildlife Areas are required, all of which include taller vegetation across the entire width of the 150-foot wide corridor to facilitate wildlife movement. (See Appendix C.) In addition, outside the areas where taller vegetation is required the entire Segment 1 corridor must be maintained with tapered vegetation. This tapered vegetation reduces the scrub-shrub portion of the corridor from 150 to approximately 54 feet (the area under the wire zone), benefiting wildlife movement. Outside of Segment 1, the proposed transmission line will be co-located with or immediately adjacent to an existing cleared corridor, minimizing fragmentation and the impact to wildlife movement. The Department finds that with this required vegetation management and co-location, the buffer strips proposed and required by this Order will provide adequate space for movement of wildlife between important habitats.

With regard to screening, the visual impacts of the project are evaluated in Section 5, above. Tapering the vegetation for the Segment 1 corridor will minimize the visual impact of that portion of the corridor, particularly from elevated viewpoints. Taller vegetation within Wildlife Areas also will buffer the view of the corridor for those fishing or otherwise recreating on the streams crossed by the project. In addition, the applicant proposes plantings at both crossings of the Old Canada Road, the AT crossing at the Troutdale Road, and the Fickett Road Substation. The Department finds the required vegetation management, maintaining existing vegetation at the Merrill Road Converter Station, and the plantings proposed by the applicant will adequately shield adjacent uses from the project.

With regard to water quality and protection of wells, the proposed buffers are sufficient, provided they are adhered to by the applicant.

Overall, with the conditions imposed in this Order, the Department finds the applicant has made adequate provision for buffer strips, provided the applicant:

- Maintains taller vegetation and tapered vegetation within the corridor as outlined in Appendix C;
- Plants and maintains vegetated roadside buffers, and replaces any dead buffer plantings within one year of the vegetation dying, at the following locations: Old Canada Road (Route 201) crossings in Johnson Mountain Twp and Moscow, Troutdale Road crossing in Bald Mountain Twp, and on the south side of Fickett Road in conjunction with the Fickett Road Substation;
- In the area adjacent to Moxie Pond in Segment 2, the applicant must construct and maintain the project with a 100-foot riparian filter area identical to the riparian filter areas adjacent to coldwater fishery streams in Segment 1; and
- Provides a list of buffers surrounding private or public water supply wells to the Department prior to construction and adheres to the buffers during construction.

10. SOILS

As set forth in 38 M.R.S. § 484(4), an applicant must demonstrate that the proposed project will be built on soil types that are suitable to the nature of the development. An applicant also must demonstrate the proposed activity will not cause unreasonable erosion of soil or sediment. Pursuant to 38 M.R.S. § 484(9), any blasting that is required for the project must comply with the requirements of 38 M.R.S. § 490(Z).

To demonstrate the suitability of the soils, the applicant submitted a soil survey map and report and a geotechnical report describing the soils found within the NECEC project site. The applicant submitted a Class B soil survey and report for the Merrill Road Converter Station and the Fickett Road Substation. In addition, the applicant submitted a Class D soil survey and report for the transmission line portion of the project. These reports were prepared by a certified soil scientist and reviewed by the Department. The Department also reviewed a blasting plan submitted by the applicant that outlines the proposed procedures for removing ledge at the Merrill Road Converter Station and for installation of structures where necessary. If a rock crusher is utilized on site, the applicant must insure that the crusher is licensed by the Department's Bureau of Air Quality and is operated in accordance with that license.

The Department finds that, based on the soil and geotechnical reports and the blasting plan, the soils on the project site present no limitations to the proposed project that cannot be overcome through standard engineering practices. The Department further finds the proposed project will be built on soil types that are suitable to the nature of the undertaking and, for the reasons noted here and discussed below in Section 11, will not cause unreasonable erosion of soil or sediment.

11. STORMWATER MANAGEMENT

The Site Law, in 38 M.R.S §484(4-A), requires an applicant to demonstrate that the proposed development meets the standards for stormwater management set forth in 38 M.R.S. § 420-D and the standard for erosion and sedimentation control in 38 M.R.S. § 420-C. Additionally, an applicant must demonstrate the proposed activity will not cause unreasonable erosion of soil or sediment. The proposed project includes approximately 19.27 acres of developed area, of which 12.55 acres is impervious area at the converter station and substations. The transmission line corridor is not developed area as defined in Chapter 500 because it is not mowed more than twice per year.

A. Basic Standards

(1) Erosion and Sedimentation Control

The applicant submitted an Erosion and Sedimentation Control Plan (Section 14 of its Site Law application) that is based on the performance standards contained in Appendix A of Chapter 500 and the Best Management Practices outlined in the Maine Erosion and Sediment Control BMPs, which were developed by the Department. This plan and plan sheets containing erosion control details were reviewed by, and revised in response to the comments from, Department staff. Staff recommend the applicant perform a complete GIS analysis, including both soils and topographic data, on Segment 1 to determine the areas with high erosion risk. The Department commented that the high-risk areas must:

- Receive a higher frequency of environmental inspection as outlined in page 14-3 of the application;
- Have a dedicated Erosion and Sediment Control (ESC) maintenance crew;
- Have additional structural ESC measures, which can include multiple layers of sediment barriers, upgradient flow diversion structures, and temporary sediment basins, depending on the location; and
- Have an accelerated work schedule to the maximum extent practicable.

In response to these comments, on June 29, 2018, the applicant submitted a table that identifies areas along Segment 1 that meet the criteria for higher risk of erosion. The areas identified by the applicant have been incorporated into Appendix G. These areas must receive the additional erosion and sedimentation control measure described above.

In its review of the application amendment for a HDD under the Upper Kennebec River, the Department commented that prior to start of the drilling operation, the applicant should submit for review and approval, the location of the disposal area for the cuttings from the drilling operation.

Due to the length of the transmission line portion of the project, the number of segments involved, and the amount of material that must be removed for construction of the Merrill Road Converter Station, the applicant must retain the services of no fewer than one third-party inspector for each transmission line segment under construction at any one time,

and one third-party inspector for the converter station. If CMP's contractors employ multiple crews working in multiple locations within a segment, the Department may require more third-party inspectors. Details of the erosion control requirements will be included on the final construction plans and the erosion control narrative will be included in the project specifications to be provided to the construction contractor. Prior to the start of construction, the applicant must conduct a pre-construction meeting to discuss the construction schedule and the erosion and sediment control plan with the appropriate parties. This meeting must be attended by the applicant's representative, Department staff, the design engineer, the contractor, and the third-party inspectors. The applicant must retain the services of the third-party inspectors in accordance with the Special Condition for Third Party Inspection Program, which is attached to this Order.

(2) Inspection and Maintenance

The applicant submitted a maintenance plan that addresses both short and long-term maintenance requirements. The maintenance plan is based on the standards contained in Appendix B of Chapter 500. This plan was reviewed by, and adequately revised in response to comments from, the Department.

(3) Housekeeping

The proposed project will comply with the performance standards outlined in Appendix C of Chapter 500.

(4) Summary

Based on the Department's review of the erosion and sedimentation control plan and the maintenance plan, the Department finds that the proposed project meets the Basic Standards contained in Chapter 500, § 4(B), provided the applicant:

- Retains no fewer than one third-party inspector for each transmission line segment under construction at any one time, and one third-party inspector for the Merrill Road Converter Station. The inspectors must be retained and work in accordance with the Special Condition for Third Party Inspection Program included with this Order.
- Conducts additional erosion control inspections, have dedicated crews, install additional erosion control structures, and have an accelerated work schedules, for the areas identified in Appendix G.
- Prior to start of the drilling operation under the Kennebec River, submits for review and approval, the location of the disposal area for the cuttings from the drilling operation.

B. General and Phosphorus Standards

The applicant's stormwater management plan includes general treatment measures that will mitigate for the increased frequency and duration of channel erosive flows due to

runoff from smaller storms, provide for effective treatment of pollutants in stormwater, and mitigate potential temperature impacts. This mitigation will be achieved by using Best Management Practices (BMPs) that will control runoff from no less than 95% of the impervious area and no less than 80% of the developed area. The access road to the proposed project meets the definition of "a linear portion of a project" in Chapter 500 and the applicant is proposing to control runoff volume from no less than 75% of the impervious area and no less than 50% of the developed area.

(1) Merrill Road Converter Station

The Merrill Road Converter Station will result in 13.42 acres of new developed area, of which 8.11 acres are impervious. It lies within the watershed of the Androscoggin River. The applicant submitted a stormwater management plan based on the Basic, General, and Flooding standards contained in Chapter 500. As currently designed, the converter station pad is self-treating. The proposed stormwater management system for other impervious and developed areas consists of two grassed, underdrained soil filters.

(2) Fickett Road and Surowiec Substations

The Fickett Road Substation will result in 4.87 acres of developed area, of which 3.90 acres are impervious. The applicant submitted a stormwater management plan based on the Basic, Phosphorus, and Flooding standards contained in Chapter 500. The stormwater management system will consist of a self-treating pad for the substation and a grassed, underdrained soil filter. The Surowiec Substation upgrades will result in no new developed area and 0.01 acre of new impervious area within the existing yard. No additional stormwater management system is required for this small amount of new impervious area. Because both the Fickett Road Substation and the Surowiec Substation are located in the watershed of Runaround Pond, a lake most at risk from development, stormwater runoff from the project site will be treated to meet the phosphorus standard outlined in Chapter 500, § 4(D). The applicant's phosphorus control plan was developed using methodology developed by the Department and outlined in "Phosphorus Control in Lake Watersheds: A Technical Guide for Evaluating New Development." For the Fickett Road Substation, the Permitted Phosphorus Export is 0.51 pounds of phosphorus per year. The predicted phosphorus export for the project site based on the applicant's model is 0.45 pounds of phosphorus per year. For the Surowiec Substation, the Permitted Phosphorus Export is 2.19175 pounds of phosphorus per year. The current export is 0.4225 pounds per year and the proposed increase is 0.4275 pounds per year, for a total of 0.85 pounds of phosphorus per year from the site. The proposed stormwater treatment at both the Fickett Road Substation and the Surowiec Substation will be able to reduce the export of phosphorus in the stormwater runoff below the maximum permitted phosphorus export for the sites.

(3) Other Substations

Improvements at the other substations will not result in any increased developed or impervious area and stormwater treatment is not required.

(4) Summary

The stormwater management system proposed by the applicant was reviewed by the Department and revised by the applicant in response to these comments. After a final review, the Department finds that the proposed stormwater management system is designed in accordance with the General and the Phosphorus Standards contained in Chapter 500, § 4(C). The applicant must retain the stormwater design engineer to oversee the installation of the stormwater best management practices. At least once per year, or within 30 days of completion, the applicant must submit an update or as-built plans to the Department for review.

Based on the stormwater system's design, the Department finds that the applicant has made adequate provision to ensure that the proposed project will meet the General and the Phosphorus Standards contained in Chapter 500, § 4(C), provided the applicant:

- Complies with the reporting and inspection requirements summarized in Section 11(B)(4) of this Order.

C. Flooding Standard

The applicant is proposing to utilize a stormwater management system based on estimates of pre- and post-development stormwater runoff flows obtained using Hydrocad. Hydrocad is a stormwater modeling software that utilizes the methodologies outlined in Technical Releases #55 and #20, U.S.D.A., Soil Conservation Service, and retains stormwater from 24-hour storms of 2-, 10-, and 25-year frequency. The post-development peak flow from the substations will not exceed the pre-development peak flow from the site.

Based on the system's design and the Department's review, the Department finds the applicant has made adequate provision to ensure that the proposed project will meet the Flooding Standard contained in Chapter 500, § 4(F) for peak flow from the project site, and channel limits and runoff areas.

12. GROUNDWATER

Site Law, in 38 M.R.S.A. § 484(5), requires an applicant to demonstrate that the proposed development will not pose an unreasonable risk that a discharge to a significant groundwater aquifer will occur. Chapter 375, §§ 7 & 8 require an applicant to show that that a proposed development will not have an unreasonable adverse effect on groundwater quality or quantity.

The applicant does not propose any withdrawal from, or discharge to, the groundwater. The transmission line portion of the project traverses 30 significant sand and gravel aquifers. The proposed Fickett Road Substation and the Merrill Road Converter Station are not located in sole source aquifer areas or over significant sand and gravel aquifers. Existing substations affected by the proposed project include Crowley's, Coopers Mills,

Larrabee Road, Maine Yankee, Raven Farm, and Surowiec substations. Larrabee Road Substation is the only substation positioned over a sand and gravel aquifer. Department staff reviewed the project and determined that if a Spill Prevention, Control, and Countermeasures (SPCC) Plan is required for the equipment to be installed at the Merrill Road Converter Station, it must be submitted for review prior to operation.

The Department finds that the proposed project will not pose an unreasonable risk that a discharge to a significant groundwater aquifer will occur. The Department further finds that the proposed project will not have an unreasonable adverse effect on ground water quality or quantity, provided the applicant:

- Submits an SPCC Plan for the Merrill Road Converter Station to the Department prior to operation, if such a plan is required by 40 CFR Part 112.

13. WATER SUPPLY

The Department evaluates the availability of adequate water supply pursuant to Chapter 375, § 18.

No wells are proposed for the new Merrill Road Converter Station or the new Fickett Road Substation. Coopers Mills, Larrabee Road, Raven Farm and Surowiec substations have existing wells. No common wells or public water supply wells are proposed to be used. Water may be necessary during construction for dust control. For dust control CMP proposes to use either municipal water or publicly available surface water sources, accessible from stable locations, such as bridges, roads or boat ramps, if necessary.

The Department finds that the applicant has made adequate provision for securing and maintaining a sufficient and healthful water supply.

14. WASTEWATER DISPOSAL

Pursuant to the Site Law, 38 M.R.S. § 484(6), an applicant must demonstrate that it has made adequate provision for wastewater disposal.

The proposed project will not generate any additional wastewater. Existing wastewater disposal systems at Coopers Mills, Larrabee Road, Raven Farm, and Surowiec substations will be utilized by the applicant.

The Department finds that the applicant has made adequate provisions for wastewater disposal.

15. SOLID WASTE

Pursuant to the Site Law, 38 M.R.S. § 484(6) and Chapter 375, § 16, an applicant must demonstrate that it has made adequate provision for solid waste disposal

The proposed project is anticipated to generate 50 cubic yards of food waste, plastics, and common trash, when completed, which will be hauled to a licensed disposal location by a licensed non-hazardous waste transporter. All general solid wastes from the proposed project will be disposed of at facilities pre-approved by CMP and the list of facilities will be submitted to the Department for review and approval prior to construction. Facilities operated by Casella Waste Systems, Inc., including the State-owned Juniper Ridge Landfill in Old Town, ME, have been pre-approved by CMP and have been demonstrated to have adequate capacity as approved by the Department. These facilities are currently in substantial compliance with the Maine Solid Waste Management Rules.

The proposed project will generate approximately 30,000 cubic yards of stumps and grubblings. Wood materials associated with clearing will be sold as marketable timber, chipped for biomass facilities, manufactured into erosion control mulch, and/or chipped and spread within the corridor. These materials are not proposed to be shipped to a landfill. Any excess soils removed as part of this project will be utilized on site or will be removed to other exempt or permitted facilities. Any wood that is chipped and spread on the corridor must be left in layers no more than two inches thick, as measured above the mineral soil surface.

The proposed project will generate approximately 153 cubic yards of construction debris and demolition debris, including wooden cable spools and pallets, wooden insulator crates, and concrete debris. Wooden cable spools, metals, concrete debris, and porcelain insulators will be recycled by Casella Waste Systems. Metals will be disposed of at Schnitzer Steel Industries, Inc. facilities in Auburn and Portland, Maine. All remaining construction and demolition debris will be disposed of at facilities pre-approved by CMP. Facilities operated by Casella Waste Systems, Inc. have been pre-approved by CMP and have been approved by the Department. They are currently in substantial compliance with the Maine Solid Waste Management Rules. If a contractor chooses a facility other than one operated by Casella Waste Systems or Schnitzer Steel Industries, the applicant must receive approval from the Department prior to material being taken to that facility.

Based on the evidence summarized above, the Department finds that the applicant has made adequate provision for solid waste disposal, provided the applicant:

- Receives approval from the Department prior to any material being taken to a facility other than Casella Waste Systems or Schnitzer Steel Industries.

16. FLOODING

Site Law, in 38 M.R.S. § 484(7), and NRPA, in 38 M.R.S. § 480-D(6), require an applicant to demonstrate that the proposed activity will not unreasonably cause or increase flooding

The transmission line portion of the proposed project will have 30 structures located within the 100-year flood plain of any river or stream, three in Segment 3, 22 in Segment 4, and five in Segment 5.

There is limited additional impervious area associated with each structure. The placement of these structures is not expected to result in any increase in flooding. Portions of the Surowiec Substation and the Fickett Road Substation are also located in the 100-year flood plain. The substations will be designed and constructed at a final elevation such that the equipment will not be inundated during a 100-year flood event.

The Department finds that the proposed project is unlikely to cause or increase flooding or cause an unreasonable flood hazard to any structure.

17. ALTERATION OF CLIMATE

The Department received extensive public comment, as well as written argument from Groups 3 and 4 and the Applicant, concerning whether and how potential greenhouse gas (GHG) emission reductions resulting from the project have regulatory significance under the applicable permitting standards. Some members of the public testified the project is urgently needed to reduce regional GHG emissions, while others challenged whether such emission reductions would even occur, and argued any such reductions have not been adequately proven. Groups 3 and 4 also asserted that the Department's standards for evaluating adverse environmental effects under Site Law, as set forth in Chapter 375, require the Department to undertake an analysis of a proposed project's impact on global climate change. The relevant section of Chapter 375 reads in its entirety as follows:

2. No Unreasonable Alteration of Climate

- A. Preamble.** The Department recognizes the potential of large-scale, heavy industrial facilities, such as power generating plants, to affect the climate in the vicinity of their location by causing changes in climatic characteristics such as rainfall, fog, and relative humidity patterns.
- B. Scope of Review.** In determining whether the proposed development will cause an unreasonable alteration of climate, the Department shall consider all relevant evidence to that effect.
- C. Submissions.** Applications for approval of large-scale, heavy industrial developments, such as power generating plants, shall include evidence that affirmatively demonstrates that there will be no unreasonable alteration of climate, including information such as the following, when appropriate:
 - (1) Evidence that the proposed development will not unreasonably alter the existing cloud cover, fog, or rainfall characteristics of the area.
- D. Terms and Conditions.** The Department may, as a term or condition of approval, establish any reasonable requirement to ensure that the proposed development will not cause an unreasonable alteration of climate.

Chapter 375, § 2. Read in context, this provision is not directed at issues of global climate change, but instead is exclusively concerned with the potential for highly localized climate impacts that facilities such as powerplants could have on atmospheric conditions such as rainfall, fog, and humidity. Chapter 375, § 2(A) & (C)(1). The Department has consistently interpreted Chapter 375, § 2 in this manner, and has never before construed it as applying to issues of global climate change. Neither Site Law nor NRPA in their current form, and as applicable to this project, require an applicant to make any particular showing regarding a project's impact on global climate change. To the extent Chapter 375, § 2 has any applicability to this project, the Department finds the project will not cause any adverse environmental impact on climate, as that term is used in the regulation.

Although not relevant under Chapter 375, § 2, the issue of GHG emission reductions is material to the Department's review of this project because its stated purpose is to provide clean, renewable energy to the regional energy grid. The Department considers a project's purpose in the context of evaluating whether the totality of its adverse environmental effects is reasonable. As described in detail above, construction and maintenance of the project will cause some adverse environmental effects on habitat, scenic character, and existing uses. Climate change, however, is the single greatest threat to Maine's natural environment. It is already negatively affecting brook trout habitat, and those impacts are projected to worsen. It also threatens forest habitat for iconic species such as moose, and for pine marten, an indicator species much discussed in the evidentiary hearing. Failure to take immediate action to mitigate the GHG emissions that are causing climate change will exacerbate these impacts. The Maine Public Utilities Commission (PUC), which has jurisdiction necessary to assess GHG emissions from the project in light of its impact on the electricity grid, concluded that, "the NECEC [project] will result in significant incremental hydroelectric generation from existing and new sources in Quebec and, therefore, will result in reductions in overall GHG emissions through corresponding reductions of fossil fuel generation (primarily natural gas) in the region."⁴³ The Department reviewed documents in the PUC's proceeding, including the London Economics International, LLC report.⁴⁴ The Department also reviewed the Examiner's Report and finds its conclusions to be credible. The Department accepts the PUC's finding on this issue and weighs the NECEC project's reductions in GHG emissions against the project's other impacts in its reasonableness determination.

In doing so, the Department finds the adverse effects to be reasonable in light of the project purpose and its GHG benefits, provided the project is constructed in accordance with the terms and conditions of this Order.

⁴³ Public Utilities Commission Examiner's Report (March 29, 2019), Docket No. 2017-00232 at 114.

⁴⁴ "Independent Analysis of Electricity Market and Macroeconomic Benefits of the New England Clean Energy Conned Project" dated May 21, 2018, prepared by London Economics International, LLC.

18. DECOMMISSIONING REQUIREMENTS

Segment 1 is a new transmission line corridor in a largely undeveloped area of the State. The Department finds that to ensure this segment of the project and associated infrastructure will not adversely affect the scenic character and natural resources of the region, 38 M.R.S. § 484(3), Segment 1 must be decommissioned when this portion of the project reaches the end of its useful life or the applicant ceases operation of this transmission line. Therefore, the applicant must demonstrate, in the form of a decommissioning plan, the means by which decommissioning of Segment will be accomplished. The plan must be submitted within one year of the start of commercial operation of the project. The decommissioning plan must include the following:

- A. Trigger for implementation of decommissioning. The current contracts are valid for a period of 20 years, but may be renewed. If the contracts are not renewed or for some other reason, the Segment 1 transmission line does not conduct electricity for a period of 12 consecutive months, decommission must begin within 18 months of the end of the contract or the last day of operation, whichever comes first.
- B. Description of work. The description of work contained in the plan must include the manner in which the transmission line, structures, and other components of the project would be dismantled and removed from the site. Subsurface components must be removed to a minimum of 24 inches below grade, and disturbed areas must be permanently stabilized. At the time of decommissioning, the applicant must submit a plan for continued beneficial use of any components proposed to be left on-site to the Department for review and approval.
- C. Financial Assurance. The plan must include financial assurance for the decommissioning costs in the form of a decommissioning bond, irrevocable letter of credit, establishment of an escrow account, or other form of financial assurance accepted by the Department, for the total cost of decommissioning. The cost of decommissioning must be reevaluated in years 10 and 15 of commercial operation, and every five years thereafter, and the amount of financial assurance adjusted remains sufficient to cover the full cost of decommissioning.

Provided the applicant submits a decommissioning plan and complies with the requirements described above, the Department finds the project will be adequately decommissioned at the end of its useful life and will not adversely affect the scenic character and natural resources of the region. 38 M.R.S. § 484(3).

19. MAINE LAND USE PLANNING COMMISSION CERTIFICATION

The LUPC reviewed the portion of the proposed NECEC project located in the unorganized or deorganized areas of the State. On January 8, 2020, the LUPC certified to the Department (SLC-9) that the project is an allowed use within the subdistricts in which it is proposed and that the project complies with all of the Commission's applicable land use standards, those not considered in the Department's review.

The LUPC certification, including its conditions, is incorporated into and made part of this Order. A copy of the LUPC's certification is included in Appendix H.

BASED on the above findings of fact, and subject to the conditions listed below, the Department makes the following conclusions pursuant to 38 M.R.S. §§ 480-A–480-JJ and Section 401 of the Federal Water Pollution Control Act:

- A. The proposed activity will not unreasonably interfere with existing scenic, aesthetic, recreational, or navigational uses, provided the applicant complies with the requirements in Section 5 and the corresponding conditions below.
- B. The proposed activity will not cause unreasonable erosion of soil or sediment, provided the applicant complies with the requirements in Section 11 and the corresponding conditions below.
- C. The proposed activity will not unreasonably inhibit the natural transfer of soil from the terrestrial to the marine or freshwater environment.
- D. The proposed activity will not unreasonably harm any significant wildlife habitat, freshwater wetland plant habitat, threatened or endangered plant habitat, aquatic habitat, travel corridor, freshwater, estuarine, or marine fisheries or other aquatic life, provided the applicant complies with the requirements in Section 7 and the corresponding conditions below.
- E. The proposed activity will not unreasonably interfere with the natural flow of any surface or subsurface waters.
- F. The proposed activity will not violate any state water quality law including those governing the classifications of the State's waters.
- G. The proposed activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties.
- H. The proposed activity is not on or adjacent to a sand dune.
- I. The proposed project is a crossing of five outstanding river segments identified in 38 M.R.S. § 480-P, however, the applicant has demonstrated there are no practicable alternatives that would have less adverse effect upon the natural and recreational features of the river segments.

BASED on the above findings of fact, and subject to the conditions listed below, the Department makes the following conclusions pursuant to 38 M.R.S. §§ 481–489-E:

- A. The applicant has provided adequate evidence of financial capacity and technical ability to develop the project in a manner consistent with state environmental standards,

provided the applicant submits additional financial information as required in Section 2 and in the corresponding condition below.

- B. The applicant has made adequate provision for fitting the development harmoniously into the existing natural environment and the development will not adversely affect existing uses, scenic character, air quality, water quality or other natural resources in the municipality or in neighboring municipalities provided the applicant complies with the requirements in Sections 4, 5, 6, 7, 8, 9, 12, 15, and 18 and the corresponding conditions below.
- C. The proposed development will be built on soil types which are suitable to the nature of the undertaking and will not cause unreasonable erosion of soil or sediment nor inhibit the natural transfer of soil. The applicant has made adequate provision to ensure blasting during construction of the project will be in compliance with 38 M.R.S. § 490-Z.
- D. The proposed development meets the standards for stormwater management in 38 M.R.S. § 420-D and the standard for erosion and sedimentation control in 38 M.R.S. § 420-C provided that the applicant complies with the requirements in Section 11 and the corresponding conditions below.
- E. The proposed development will not pose an unreasonable risk that a discharge to a significant groundwater aquifer will occur provided that the applicant complies with the requirements in Section 12 and the corresponding condition below.
- F. The applicant has made adequate provision of utilities, including water supplies, sewerage facilities and solid waste disposal required for the development and the development will not have an unreasonable adverse effect on the existing or proposed utilities in the municipality or area served by those services provided the applicant complies with the requirements in Section 15 and the corresponding condition below.
- G. The activity will not unreasonably cause or increase the flooding of the alteration area or adjacent properties nor create an unreasonable flood hazard to any structure.
- H. No further project modification or conditions regarding the transmission line's location, character, width, or appearance, beyond what is required by this Order, are warranted, under 38 M.R.S. § 487-A(4) or otherwise, to lessen the transmission line's impact on the environment or risk to public health or safety.

THEREFORE, the Department APPROVES the application of CENTRAL MAINE POWER COMPANY for the New England Clean Energy Connect Project as described in Finding 1, SUBJECT TO THE FOLLOWING CONDITIONS and all applicable standards and regulations:

1. The Standard Conditions of Approval, a copy attached.
2. In addition to any specific erosion control measures described in this or previous orders, the applicant shall take all necessary actions to ensure that its activities or those of its agents do not result in noticeable erosion of soils or fugitive dust emissions on the site during the construction and operation of the project covered by this approval.
3. Severability. The invalidity or unenforceability of any provision, or part thereof, of this License shall not affect the remainder of the provision or any other provisions, unless the Department determines that said invalidity or unenforceability results in a project that would violate applicable statutory or regulatory standards, in which case the applicant shall file an application to modify the license to ensure full compliance. This License shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.
4. Prior to the start of construction, the applicant shall submit evidence that it has been granted a line of credit or a loan by a financial institution authorized to do business in this State, or evidence of any other form of financial assurance consistent with Department Rules, Chapter 373, § 2(B), to the Department for review and approval.
5. Prior to the start of construction, CMP shall establish an escrow account, secure an irrevocable letter of credit, or otherwise provide a financial guarantee acceptable to the Department, to fund \$1,875,000 of culvert replacements. Prior to commercial operation of the project, the applicant shall submit a plan to the Department for review and approval that establishes the locations of the culvert replacements and how the funds will be disbursed. The culverts to be replaced must be in the vicinity of Segments 1 or 2, must completely or partially block fish passage, must be replaced with crossings consistent with Stream Smart principles, and must be selected to provide the greatest possible habitat benefit. CMP shall document each culvert replacement, monitor those replacements for one year from the date of replacement, and submit a summary report to the Department for review within eighteen months of the date of the last replacement.
6. Prior to the start of construction, the applicant shall conserve the Basin Tract, Lower Enchanted Tract, and Grand Falls Tract, which together include 1,053.5 acres of land and 12.02 linear miles of stream.
7. Prior to the start of construction, the applicant shall conserve the Little Jimmy Pond Tract, Flagstaff Lake Tract, and Pooler Pond Tract, which together include 510.75 acres of wetland and 1,022.4 acres of land area.
8. Prior to the start of construction, the applicant shall conserve 717 acres of land within the Upper Kennebec River DWA.

9. Prior to the start of construction, the applicant shall contribute:
 - a. A total of \$877,010.06 in In-Lieu-Fee payments to the Department for the Maine Natural Resource Conservation Program for impacts to SVPs (\$623,657.53) and IWWHs (\$253,352.53), and
 - b. A total of \$649,771.95 to Maine Endangered and Nongame Fund for impacts to NSS and RBM habitat (\$469,771.95) and forest conversion in riparian buffers (\$180,000.00).
10. Prior to the start of construction, the applicant shall contribute \$1,234,526.82 to the Maine Natural Areas Conservation Fund for impacts to Goldie's Wood Fern and the Jack Pine Forest.
11. Prior the start of construction on each transmission line segment, the HDD under the Upper Kennebec River, the Merrill Road Converter Station, and the Fickett Road Substation, the applicant shall conduct a pre-construction meeting to discuss, among other topics, construction schedule, erosion and sedimentation control, and adherence to the conditions of this Order. This meeting shall be attended by the applicant's representative, Department staff, the design engineer, the contractor, and the third-party inspector for that portion of the project.
12. The applicant shall update its VCP and VMP to be consistent with the requirements of this Order, including but not limited to the vegetation management required in Appendix C, and submit the updated plans to the Department for review and approval prior to the start of construction (which includes clearing) within the corridor.
13. The applicant shall maintain taller vegetation within the Segment 1 corridor as outlined in Appendix C, including by:
 - a. Maintaining full canopy height vegetation in the locations identified in Table C-1,
 - b. Maintaining vegetation with a minimum height of 35 feet in the locations identified in Table C-1,
 - c. Maintaining deer travel corridors in the locations identified in Table C-1, and
 - d. Maintaining tapered vegetation along the entire Segment 1 corridor, except where full canopy height vegetation, vegetation with a minimum height of 35 feet, or taller vegetation managed for deer travel corridors is required.
14. The applicant shall leave any trees that have been cut during routine maintenance in areas where tapering or vegetation with a minimum height of 35 feet is required, unless doing so would violate the Slash Law or create a fire or safety hazard.
15. Any wood that is chipped and spread on the corridor shall be left in layers no more than two inches thick, as measured above the mineral soil surface.
16. The applicant shall maintain 100-foot riparian filter areas along all perennial streams in Segment 1, all coldwater fisheries streams in other segments as identified in Appendix E, all streams containing threatened or endangered species, and all Outstanding River Segments; and maintain 75-foot riparian filter areas on all other streams.

17. In the area adjacent to Moxie Pond in Segment 2, the applicant shall construct and maintain the project with a 100-foot riparian filter area identical to the riparian filter areas adjacent to coldwater fishery streams in Segment 1.
18. The applicant shall provide a list of buffers surrounding private or public water supply wells to the Department prior to construction and adhere to the buffers during construction.
19. The applicant shall limit construction activities in mapped habitat for wood turtles to between October 15 and April 15 (prohibiting construction between April 16 and October 14) in any calendar year.
20. The applicant shall limit construction activities in mapped habitat for Rusty Black Birds to between July 1 and April 19 (prohibiting construction between April 20 and June 30) in any calendar year.
21. The applicant shall maintain 10-15-foot tall spruce/fir vegetation in the mapped Rusty Black Bird habitat.
22. The applicant shall complete a survey for Great Blue Heron colonies within or immediately adjacent to existing IWWH between April 20 and May 31, and prior to initial transmission line clearing; if any colonies are identified, the applicant shall consult with MDIFW and obtain approval from the Department prior to construction in the vicinity of any colony.
23. The applicant shall plant and maintain vegetated roadside buffers, and replace any dead buffer plantings with one year of the vegetation dying, at the following locations: Old Canada Road (Route 201) crossings in Johnson Mountain Twp and Moscow, Troutdale Road crossing in Bald Mountain Twp, and on the south side of Fickett Road in conjunction with the Fickett Road Substation.
24. The applicant shall mark the location of all natural resource buffers with flagging prior to the start of construction.
25. The applicant shall permanently mark all natural resource buffers upon completion of construction.
26. The applicant shall mark all natural resource buffers with flagging prior to any maintenance activities.
27. The applicant shall retain no fewer than one third-party inspector for each transmission line segment under construction at any one time, and one third-party inspector for the Merrill Road Converter Station. The inspectors must be retained and work in accordance with the Special Condition for Third Party Inspection Program included with this Order.

28. Prior to start of the drilling operation under the Kennebec River, the applicant shall submit for review and approval, the location of the disposal area for the cuttings from the drilling operation.
29. Any new equipment the applicant installs at Merrill Road Converter Station, the Larrabee Road, Fickett Road, and Coopers Mills Road substations, shall meet the sound power limits listed in Appendix D, Table D-1 (incorporating the limits from the Site Law application, Tables 5-8, 5-11, 5-15, and 5-19).
30. Any new equipment the applicant installs at Raven Farm Substation shall meet the sound power limit listed in Appendix D, Table D-1 (incorporating the base option listed in the Table 6-1 of the Raven Farm Substation Sound Study).
31. The applicant shall install sound walls at the Coopers Mills Road Substation, as proposed, with the final design supported by additional acoustic modeling using vendor-supplied octave band sound power levels, and submit the final design and modeling results to the Department for review and approval prior to operation of the new equipment at the substation.
32. The applicant shall install non-specular conductors within the viewshed of Coburn Mountain (between structures #3006-634 and #3006-616), Rock Pond (between structures #3006-731 and #3006-724), Moxie Stream (between structures #3006-542 and #3006-541), and the Appalachian Trail (between structures #3006-529 and #3006-458).
33. The applicant shall install shorter poles along Moxie Pond (structures #3006-529 and #3006-458).
34. The applicant shall conduct additional erosion control inspections, have dedicated crews, install additional erosion control structures, and have accelerated work schedules, for the areas identified in Appendix G.
35. The applicant shall retain the stormwater design engineer to oversee the installation of the stormwater best management practices. At least once per year, or within 30 days of completion, the applicant shall submit an update or as-built plans to the Department for review.
36. The applicant shall submit an SPCC Plan for the Merrill Road Converter Station to the Department prior to operation, if such a plan is required pursuant to 40 CFR Part 112.
37. The applicant shall receive approval from the Department prior to any material being taken to a facility other than Casella Waste Systems or Schnitzer Steel Industries.
38. The applicant shall implement the plans for site avoidance and treatments described in the final Phase I archaeological survey report.

39. Within 18 months of the date of this Order, the applicant shall develop and submit to the Department for review and approval a Conservation Plan, consistent with Section 7(D)(2)(a)(3), to permanently conserve 40,000 acres in the vicinity of Segment 1. Prior to commercial operation of the project, the applicant must fully implement the approved Conservation Plan, unless, upon a showing by the applicant that it has made reasonable, good faith efforts to implement the Conservation Plan and addition time, not more than four years from the date of this Order, is needed, the Department approves an extension of the implementation deadline. Prior to implementation, all forest management plans, and all conservation easements, deed restrictions, covenants, or other legal instruments designed to fulfill the objectives of the Conservation Plan, must be submitted to the Department for review and approval.

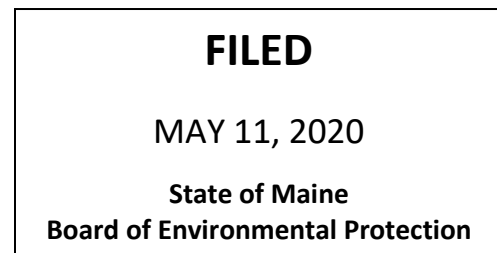
THIS APPROVAL DOES NOT CONSTITUTE OR SUBSTITUTE FOR ANY OTHER REQUIRED STATE, FEDERAL OR LOCAL APPROVALS NOR DOES IT VERIFY COMPLIANCE WITH ANY APPLICABLE SHORELAND ZONING ORDINANCES.

DONE AND DATED IN AUGUSTA, MAINE, THIS 11th DAY OF MAY, 2020,
DEPARTMENT OF ENVIRONMENTAL PROTECTION

BY: 
Gerald D Reid, Commissioner

PLEASE NOTE THE ATTACHED SHEET FOR GUIDANCE ON APPEAL PROCEDURES.

JB/L27625ANBNCNDN/ATS#82334, 82335, 82336, 82337, 82338



Department of Environmental Protection
SITE LOCATION OF DEVELOPMENT (SITE)
STANDARD CONDITIONS

- A. Approval of Variations from Plans.** The granting of this approval is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from these plans, proposals, and supporting documents is subject to review and approval prior to implementation. Further subdivision of proposed lots by the applicant or future owners is specifically prohibited without prior approval of the Board, and the applicant shall include deed restrictions to that effect.
- B. Compliance with All Applicable Laws.** The applicant shall secure and comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation, as appropriate.
- C. Compliance with All Terms and Conditions of Approval.** The applicant shall submit all reports and information requested by the Board or the Department demonstrating that the applicant has complied or will comply with all preconstruction terms and conditions of this approval. All preconstruction terms and conditions must be met before construction begins.
- D. Advertising.** Advertising relating to matters included in this application shall refer to this approval only if it notes that the approval has been granted WITH CONDITIONS, and indicates where copies of those conditions may be obtained.
- E. Transfer of Development.** Unless otherwise provided in this approval, the applicant shall not sell, lease, assign or otherwise transfer the development or any portion thereof without prior written approval of the Board where the purpose or consequence of the transfer is to transfer any of the obligations of the developer as incorporated in this approval. Such approval shall be granted only if the applicant or transferee demonstrates to the Board that the transferee has the technical capacity and financial ability to comply with conditions of this approval and the proposals and plans contained in the application and supporting documents submitted by the applicant.
- F. Time frame for approvals.** If the construction or operation of the activity is not begun within four years, this approval shall lapse and the applicant shall reapply to the Board for a new approval. The applicant may not begin construction or operation of the development until a new approval is granted. A reapplication for approval may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.
- G. Approval Included in Contract Bids.** A copy of this approval must be included in or attached to all contract bid specifications for the development.
- I. Approval Shown to Contractors.** Work done by a contractor pursuant to this approval shall not begin before the contractor has been shown by the developer a copy of this approval.

(2/81)/Revised December 27, 2011



Natural Resources Protection Act (NRPA) Standard Conditions

THE FOLLOWING STANDARD CONDITIONS SHALL APPLY TO ALL PERMITS GRANTED UNDER THE NATURAL RESOURCES PROTECTION ACT, 38 M.R.S.A. § 480-A ET SEQ., UNLESS OTHERWISE SPECIFICALLY STATED IN THE PERMIT.

- A. Approval of Variations From Plans. The granting of this permit is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from these plans, proposals, and supporting documents is subject to review and approval prior to implementation.
- B. Compliance With All Applicable Laws. The applicant shall secure and comply with all applicable federal, state, and local licenses, permits, authorizations, conditions, agreements, and orders prior to or during construction and operation, as appropriate.
- C. Erosion Control. The applicant shall take all necessary measures to ensure that his activities or those of his agents do not result in measurable erosion of soils on the site during the construction and operation of the project covered by this Approval.
- D. Compliance With Conditions. Should the project be found, at any time, not to be in compliance with any of the Conditions of this Approval, or should the applicant construct or operate this development in any way other the specified in the Application or Supporting Documents, as modified by the Conditions of this Approval, then the terms of this Approval shall be considered to have been violated.
- E. Time frame for approvals. If construction or operation of the activity is not begun within four years, this permit shall lapse and the applicant shall reapply to the Board for a new permit. The applicant may not begin construction or operation of the activity until a new permit is granted. Reapplications for permits may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.
- F. No Construction Equipment Below High Water. No construction equipment used in the undertaking of an approved activity is allowed below the mean high water line unless otherwise specified by this permit.
- G. Permit Included In Contract Bids. A copy of this permit must be included in or attached to all contract bid specifications for the approved activity.
- H. Permit Shown To Contractor. Work done by a contractor pursuant to this permit shall not begin before the contractor has been shown by the applicant a copy of this permit.

STORMWATER STANDARD CONDITIONS

STRICT CONFORMANCE WITH THE STANDARD AND SPECIAL CONDITIONS OF THIS APPROVAL IS NECESSARY FOR THE PROJECT TO MEET THE STATUTORY CRITERIA FOR APPROVAL

Standard conditions of approval. Unless otherwise specifically stated in the approval, a department approval is subject to the following standard conditions pursuant to Chapter 500 Stormwater Management Law.

- (1) Approval of variations from plans. The granting of this approval is dependent upon and limited to the proposals and plans contained in the application and supporting documents submitted and affirmed to by the applicant. Any variation from these plans, proposals, and supporting documents must be reviewed and approved by the department prior to implementation. Any variation undertaken without approval of the department is in violation of 38 M.R.S.A. §420-D(8) and is subject to penalties under 38 M.R.S.A. §349.
- (2) Compliance with all terms and conditions of approval. The applicant shall submit all reports and information requested by the department demonstrating that the applicant has complied or will comply with all terms and conditions of this approval. All preconstruction terms and conditions must be met before construction begins.
- (3) Advertising. Advertising relating to matters included in this application may not refer to this approval unless it notes that the approval has been granted WITH CONDITIONS, and indicates where copies of those conditions may be obtained.
- (4) Transfer of project. Unless otherwise provided in this approval, the applicant may not sell, lease, assign, or otherwise transfer the project or any portion thereof without written approval by the department where the purpose or consequence of the transfer is to transfer any of the obligations of the developer as incorporated in this approval. Such approval may only be granted if the applicant or transferee demonstrates to the department that the transferee agrees to comply with conditions of this approval and the proposals and plans contained in the application and supporting documents submitted by the applicant. Approval of a transfer of the permit must be applied for no later than two weeks after any transfer of property subject to the license.
- (5) Time frame for approvals. If the construction or operation of the activity is not begun within four years, this approval shall lapse and the applicant shall reapply to the department for a new approval. The applicant may not begin construction or operation of the project until a new approval is granted. A reapplication for approval may include information submitted in the initial application by reference. This approval, if construction is begun within the four-year time frame, is valid for seven years. If construction is not completed within the seven-year time frame, the applicant must reapply for, and receive, approval prior to continuing construction.
- (6) Certification. Contracts must specify that "all work is to comply with the conditions of the Stormwater Permit." Work done by a contractor or subcontractor pursuant to this approval may not begin before the contractor and any subcontractors have been shown a copy of this approval with the conditions by the developer, and the owner and each contractor and subcontractor has certified, on a form provided by the department, that the approval and conditions have been

- received and read, and that the work will be carried out in accordance with the approval and conditions. Completed certification forms must be forwarded to the department.
- (7) Maintenance. The components of the stormwater management system must be adequately maintained to ensure that the system operates as designed, and as approved by the department.
 - (8) Recertification requirement. Within three months of the expiration of each five-year interval from the date of issuance of the permit, the permittee shall certify the following to the department.
 - (a) All areas of the project site have been inspected for areas of erosion, and appropriate steps have been taken to permanently stabilize these areas.
 - (b) All aspects of the stormwater control system have been inspected for damage, wear, and malfunction, and appropriate steps have been taken to repair or replace the facilities.
 - (c) The erosion and stormwater maintenance plan for the site is being implemented as written, or modifications to the plan have been submitted to and approved by the department, and the maintenance log is being maintained.
 - (9) Severability. The invalidity or unenforceability of any provision, or part thereof, of this permit shall not affect the remainder of the provision or any other provisions. This permit shall be construed and enforced in all respects as if such invalid or unenforceable provision or part thereof had been omitted.

November 16, 2005 (revised December 27, 2011)

Special Condition
for
Third Party Inspection Program

THIRD-PARTY INSPECTION PROGRAM

1.0 THE PURPOSE OF THE THIRD-PARTY INSPECTION

As a condition of this permit, the Maine Department of Environmental Protection (MDEP) requires the permit applicant to retain the services of a third-party inspector to monitor compliance with MDEP permit conditions during construction. The objectives of this condition are as follows:

- 1) to ensure that all construction and stabilization activities comply with the permit conditions and the MDEP-approved drawings and specifications,
- 2) to ensure that field decisions regarding erosion control implementation, stormwater system installation, and natural resource protection are based on sound engineering and environmental considerations, and
- 3) to ensure communication between the contractor and MDEP regarding any changes to the development's erosion control plan, stormwater management plan, or final stabilization plan.

This document establishes the inspection program and outlines the responsibilities of the permit applicant, the MDEP, and the inspector.

2.0 SELECTING THE INSPECTOR

At least 30 days prior to starting any construction activity on the site, the applicant will submit the names of at least two inspector candidates to the MDEP. Each candidate must meet the minimum qualifications listed under section 3.0. The candidates may not be employees, partners, or contracted consultants involved with the permitting of the project or otherwise employed by the same company or agency except that the MDEP may accept subcontractors who worked for the project's primary consultant on some aspect of the project such as, but not limited to, completing wetland delineations, identifying significant wildlife habitats, or conducting geotechnical investigations, but who were not directly employed by the applicant, as Third Party inspectors on a case by case basis. The MDEP will have 15 days from receiving the names to select one of the candidates as the inspector or to reject both candidates. If the MDEP rejects both candidates, then the MDEP shall state the particular reasons for the rejections. In this case, the applicant may either dispute the rejection to the Director of the Bureau of Land Resources or start the selection process over by nominating two, new candidates.

3.0 THE INSPECTOR'S QUALIFICATIONS

Each inspector candidate nominated by the applicant shall have the following minimum qualifications:

- 1) a degree in an environmental science or civil engineering, or other demonstrated expertise,
- 2) a practical knowledge of erosion control practices and stormwater hydrology,
- 3) experience in management or supervision on large construction projects,
- 4) the ability to understand and articulate permit conditions to contractors concerning erosion control or stormwater management,
- 5) the ability to clearly document activities being inspected,
- 6) appropriate facilities and, if necessary, support staff to carry out the duties and responsibilities set forth in section 6.0 in a timely manner, and
- 7) no ownership or financial interest in the development other than that created by being retained as the third-party inspector.

4.0 INITIATING THE INSPECTOR'S SERVICES

The applicant will not formally and finally engage for service any inspector under this permit condition prior to MDEP approval or waiver by omission under section 2.0. No clearing, grubbing, grading, filling, stockpiling, or other construction activity will take place on the development site until the applicant retains the MDEP-approved inspector for service.

5.0 TERMINATING THE INSPECTOR'S SERVICES

The applicant will not terminate the services of the MDEP-approved inspector at any time between commencing construction and completing final site stabilization without first getting written approval to do so from the MDEP.

6.0 THE INSPECTOR'S DUTIES AND RESPONSIBILITIES

The inspector's work shall consist of the duties and responsibilities outlined below.

- 1) Prior to construction, the inspector will become thoroughly familiar with the terms and conditions of the state-issued site permit, natural resources protection permit, or both.
- 2) Prior to construction, the inspector will become thoroughly familiar with the proposed construction schedule, including the timing for installing and removing erosion controls, the timing for constructing and stabilizing any basins or ponds, and the deadlines for completing stabilization of disturbed soils.
- 3) Prior to construction, the inspector will become thoroughly familiar with the project plans and specifications, including those for building detention basins, those for installing the erosion control measures to be used on the site, and those for temporarily or permanently stabilizing disturbed soils in a timely manner.
- 4) During construction, the inspector will monitor the contractor's installation and maintenance of the erosion control measures called for in the state permit(s) and any additional measures the inspector believes are necessary to prevent sediment discharge to off-site properties or natural resources. This direction will be based on the approved erosion control plan, field conditions at the time of construction, and the natural resources potentially impacted by construction activities.
- 5) During construction, the inspector will monitor the contractor's construction of the stormwater system, including the construction and stabilization of ditches, culverts, detention basins, water quality treatment measures, and storm sewers.
- 6) During construction, the inspector will monitor the contractor's installation of any stream or wetland crossings.
- 7) During construction, the inspector will monitor the contractor's final stabilization of the project site.
- 8) During construction, the inspector will keep logs recording any rain storms at the site, the contractor's activities on the site, discussions with the contractor(s), and possible violations of the permit conditions.
- 9) During construction, the inspector will inspect the project site at least once a week and before and after any significant rain event. The inspector will photograph all protected natural resources both before and after construction and will photograph all areas under construction. All photographs will be identified with, at a minimum the date the photo was taken, the location and the name of the individual taking the photograph.
Note: the frequency of these inspections as contained in this condition may be varied to best address particular project needs.
- 10) During construction, the inspector will prepare and submit weekly (*or other frequency*) inspection reports to the MDEP.

- 11) During construction, the inspector will notify the designated person at the MDEP immediately of any sediment-laden discharges to a protected natural resource or other significant issues such as the improper construction of a stormwater control structure or the use of construction plans not approved by the MDEP.

7.0 INSPECTION REPORTS

The inspector will submit weekly written reports (*or at another designated frequency*), including photographs of areas that are under construction, on a form provided by the Department to the designated person at the MDEP. Each report will be due at the MDEP by the Friday (*or other designated day*) following the inspection week (Monday through Sunday).

The weekly report will summarize construction activities and events on the site for the previous week as outlined below.

- 1) The report will state the name of the development, its permit number(s), and the start and end dates for the inspection week (Monday through Sunday).
- 2) The report will state the date(s) and time(s) when the inspector was on the site making inspections.
- 3) The report will state the date(s) and approximate duration(s) of any rainfall events on the site for the week.
- 4) The report will identify and describe any erosion problems that resulted in sediment leaving the property or sediment being discharged into a wetland, brook, stream, river, lake, or public storm sewer system. The report will describe the contractor's actions to repair any damage to other properties or natural resources, actions to eliminate the erosion source, and actions to prevent future sediment discharges from the area.
- 5) The report will list the buildings, roads, parking lots, detention basins, stream crossings or other features open to construction for the week, including those features or areas actively worked and those left unworked (dormant).
- 6) For each area open to construction, the report will list the date of initial soil disturbance for the area.
- 7) For each area open to construction, the report will note which areas were actively worked that week and which were left dormant for the week. For those areas actively worked, the report will briefly state the work performed in the area that week and the progress toward final stabilization of the area -- e.g. "grubbing in progress", "grubbing complete", "rough grading in progress", "rough grading complete", "finish grading in progress", "finish grading complete", "permanent seeding completed", "area fully stable and temporary erosion controls removed", etc.
- 8) For each area open to construction, the report will list the erosion and sedimentation control measures installed, maintained, or removed during the week.
- 9) For each erosion control measure in-place, the report will note the condition of the measure and any maintenance performed to bring it to standard.

Third Party Inspection Form

This report is prepared by a Third Party Inspector to meet the requirements of the Third Party Inspector Condition attached as a Special Condition to the Department Order that was issued for the project identified below. The information in this report/form is not intended to serve as a determination of whether the project is in compliance with the Department permit or other applicable Department laws and rules. Only Department staff may make that determination.

TO: <i>PM, Maine DEP (@maine.gov)</i>	FROM:
PROJECT NAME/ LOCATION:	DEP #:
DATE OF INSPECTION:	DATE OF REPORT:
WEATHER:	CONDITIONS:

SITE CHARACTERISTICS:

# ACRES OPEN:	# ACRES ACTIVE:	# ACRES INACTIVE:
LOCATION OF OPEN LAND:	LOCATION OF ACTIVE LAND:	LOCATION OF INACTIVE LAND:
OPEN SINCE:	OPEN SINCE:	OPEN SINCE:

PROGRESS OF WORK:

INSPECTION OF:	Satisfactory	Minor Deviation (corrective action required)	Unsatisfactory (include photos)
STORMWATER CONTROL (VEGETATIVE & STRUCTURAL BMP'S)			
EROSION & SEDIMENTATION CONTROL (TEMPORARY & PERMANENT BMP'S)			
OTHER: (PERMIT CONDITIONS, ENGINEERING DESIGN, ETC.)			

COMMENTS/CORRECTIVE ACTIONS TAKEN (attach additional sheets as necessary):

Photos (must be labeled with date, photographer and location):

Cc:		
Original and all copies were sent by email only.		

Appendix A
List of Municipal and County Governments

Town	County	Senate District	House District	Congressional District
City of Auburn 60 Court Street Auburn, Maine 04210 Phone (207) 333-6600 pcrichton@auburnmaine.gov	Androscoggin County Commissioners' Office 2 Turner Street, Unit 2 Auburn, Maine 04210 Phone (207) 753-2500, Ext 1801 lpost@androscoggincounty.maine.gov	Senate District 20 Senator Eric L. Brakey 146 Pleasant Street Auburn, ME 04210 Phone (207) 406-0897 Eric.brakey@legislature.maine.gov	House District 62 Rep. Gina M. Melaragno 25 James Street, Apt. 3 Auburn, Maine 04210 Phone (207)740-8860 gina.melaragno@legislature.maine.gov House District 63 Rep. Bruce A. Bickford 64 Cameron Lane Auburn, Maine 04210 Cell Phone (207) 740-0328 bruce.bickford@legislature.maine.gov House District 64 Rep. Bettyann W. Sheats 32 Waterview Drive Auburn, Maine 04210 Cell Phone (207)740-2613 bettyann.sheats@legislature.maine.gov	Congressional District 2 Representative Bruce Poliquin 179 Lisbon Street Lewiston, ME 04240 Phone (207) 784-0768
City of Lewiston 27 Pine Street Lewiston, Maine 04240-7204 Phone (207) 513-3000 ebarrett@lewistonmaine.gov	Androscoggin County Commissioners' Office 2 Turner Street, Unit 2 Auburn, Maine 04210 Phone (207) 753-2500, Ext 1801	Senate District 21 Senator Nate Libby 44 Robinson Gardens Lewiston, ME 04240 Phone (207)713-8449 nathan.libby@legislature.maine.gov	House District 58 Rep. James R. Handy 9 Maplewood Road Lewiston, Maine 04240 Phone (207) 784-5595 jim.handy@legislature.maine.gov	2

	lpost@androscoggincounty.maine.gov		<p>House District 59 Rep. Roger Jason Fuller 36 Elliott Avenue Lewiston, ME 04240 Phone (207) 783-9091 roger.fuller@legislature.maine.gov</p> <p>House District 60 Rep. Jared F. Golden 3 Diamond Court Lewiston, ME 04240 Phone (207) 287-1430 jared.golden@legislature.maine.gov</p> <p>House District 61 Rep. Heidi E. Brooks 1 Pleasant Street, #2 Lewiston, Maine 04240 Cell Phone (207) 740-5229 heidi.brooks@legislature.maine.gov</p>	
Town of Alna 1568 Alna Rd Alna, Maine 04535 PHONE: (207) 586-5313 mmaymcc@yahoo.com dcbaston@northatlanticenergy.com	Lincoln County Commissioners Office 32 High Street, P.O. Box 249 Wiscasset, Maine 04578 Phone (207) 882-6311 ckipfer@lincounty.me	Senate District 13 Senator Dana Dow 30 Kalers Pond Road Waldoboro, Maine 04572 Phone (207) 832-4658 dana.dow@legislature.maine.gov	House District 87 Rep. Jeffery P. Hanley 52 Turner Drive Pittston, Maine 04345 Phone (207) 582-1524 Cell Phone (207) 458-9009 jeff.hanley@legislature.maine.gov	1
Town of Anson 5 Kennebec Street, PO Box 297 Anson, Maine 04911-0297	Somerset County Commissioners Office 41 Court Street	Senate District 3 Senator Rod Whittemore PO Box 96	House District 112 Rep. Thomas H. Skolfield 349 Phillips Road	2

Phone (207) 696-3979	Skowhegan, ME 04976 Phone (207) 474-9861 ddibiasi@SomersetCounty-ME.org	Skowhegan, Maine 04976 Phone (207) 474-6703 rodney.whittemore@legislature.maine.gov	Weld, Maine 04285 Phone (207) 585-2638 thomas.skolfield@legislature.maine.gov	
Town of Caratunk Elizabeth Caruso - 1st Select PO Box 180 Caratunk, Maine 04925-0180 OFFICE PHONE: 672-3030	Somerset County Commissioners Office 41 Court Street Skowhegan, ME 04976 Phone (207) 474-9861 ddibiasi@SomersetCounty-ME.org	Senate District 3 Senator Rod Whittemore PO Box 96 Skowhegan, Maine 04976 Phone (207) 474-6703 rodney.whittemore@legislature.maine.gov	House District 118 Rep. Chad Wayne Grignon 181 Fox Hill Road Athens, Maine 04912 Phone (207) 654-2771 Cell Phone (207) 612-6499 chad.grignon@legislature.maine.gov	2
Town of Chesterville 409 Dutch Gap Road Chesterville, Maine 04938 Phone (207) 778-2433 chesterville.me@gmail.com	Franklin County Commissioner's Office 140 Main Street, Suite 3 Farmington, Maine 04938 Phone (207) 778-6614 jmagoon@franklincountymaine.gov	Senate District 17 Senator Thomas Saviello 60 Applegate Lane Wilton, ME 042924 Phone (207) 287-1505 thomas.saviello@legislature.maine.gov	House District 114 Rep. Russell J. Black 123 Black Road Wilton, Maine 04294 Phone (207) 491-4667 russell.black@legislature.maine.gov	2
Town of Cumberland William R. Shane, Town Manager 290 Tuttle Road Cumberland, Maine 04021 Phone (207) 829-5559	Cumberland County Commissioners Office James Gailey, County Manager 142 Federal Street Portland, ME 04101 Phone (207) 871-8380 gailey@cumberlandcounty.org	Senate District 25 Senator Catherine Breen 15 Falmouth Ridges Drive Falmouth, Maine 04105 Phone (207) 329-6142 Cathy.breen@legislature.maine.gov	House District 45 Rep. Dale J. Denno 275 Main Street Cumberland Center, Maine 04021 Cell Phone (207) 400-1123 dale.denno@legislature.maine.gov	1 Senator Susan Collins 55 Lisbon Street Lewison, ME 04240 Phone (207) 784-6969 Senator Angus King 4 Gabriel Drive, Suite 3 Augusta, ME 04330 Phone (207) 622-8292 Phone (800) 432-1599 Representative Chellie Pingree 2Portland Fish Pier, Suite 304 Portland, ME 04101 Phone (207) 774-5019 Phone (888) 862-6500

Town of Durham 630 Hallowell Road Durham, Maine 04222 Phone (207) 353-2561	Androscoggin County Commissioners' Office 2 Turner Street, Unit 2 Auburn, Maine 04210 Phone (207) 753-2500, Ext 1801 lpost@androscoggincounty.maine.gov	Senate District 22 Senator Garrett Mason PO Box 395 Lisbon Falls, Maine 04252 Phone (207) 557-1521 garret.mason@legislature.maine.gov	House District 46 Rep. Paul B. Chace 31 Colonial Drive Durham, ME 04222 Cell Phone (207)240-9300 paul.chace@legislature.maine.gov	2
Town of Embden 809 Embden Pond Road Embden, Maine 04958-3521 Phone (207) 566-5551 embden-clerk@roadrunner.com	Somerset County Commissioners Office 41 Court Street Skowhegan, ME 04976 Phone (207) 474-9861 ddiblasi@SomersetCounty-ME.org	Senate District 3 Senator Rod Whittemore PO Box 96 Skowhegan, Maine 04976 Phone (207) 474-6703 rodney.whittemore@legislature.maine.gov	House District 118 Rep. Chad Wayne Grignon 181 Fox Hill Road Athens, Maine 04912 Phone (207) 654-2771 Cell Phone (207) 612-6499 chad.grignon@legislature.maine.gov	2
Town of Farmington 153 Farmington Falls Road Farmington, Maine 04938 Phone (207) 778-5871 rdavis@farmington-maine.org	Franklin County Commissioner's Office 140 Main Street, Suite 3 Farmington, Maine 04938 Phone (207) 778-6614 jmagoon@franklincountymaine.gov	Senate District 17 Senator Thomas Saviello 60 Applegate Lane Wilton, ME 042924 Phone (207) 287-1505 thomas.saviello@legislature.maine.gov	House District 113 Rep. Lance Evans Harvell 398 Knowlton Corner Road Farmington, Maine 04938 Phone (207) 491-8971 lance.harvell@legislature.maine.gov	2
Town of Greene 220 Main St, PO Box 510 Greene, Maine 04236-0510 Phone (207) 946-5146 tmgreene@fairpoint.net	Androscoggin County Commissioners' Office 2 Turner Street, Unit 2 Auburn, Maine 04210 Phone (207) 753-2500, Ext 1801 lpost@androscoggincounty.maine.gov	Senate District 22 Senator Garrett Mason PO Box 395 Lisbon Falls, Maine 04252 Phone (207) 557-1521 garret.mason@legislature.maine.gov	House District 57 Rep. Stephen J. Wood PO Box 927 Sabattus, Maine 04280 Cell Phone (207) 740-3723 stephen.wood@legislature.maine.gov	2
Town of Industry 1033 Industry Road Industry, Maine 04938 Phone (207) 778-5050	Franklin County Commissioner's Office 140 Main Street, Suite 3 Farmington, Maine 04938 Phone (207) 778-6614 jmagoon@franklincountymaine.gov	Senate District 17 Senator Thomas Saviello 60 Applegate Lane Wilton, ME 042924 Phone (207) 287-1505 thomas.saviello@legislature.maine.gov	House District 114 Rep. Russell J. Black 123 Black Road Wilton, Maine 04294 Phone (207) 491-4667 russell.black@legislature.maine.gov	2

Town of Jay 340 Main Street Jay, Maine 04239 Phone (207) 897-6785 joffice@jay-maine.org	Franklin County Commissioner's Office 140 Main Street, Suite 3 Farmington, Maine 04938 Phone (207) 778-6614 jmagoon@franklincountymaine.gov	Senate District 17 Senator Thomas Saviello 60 Applegate Lane Wilton, ME 042924 Phone (207) 287-1505 thomas.saviello@legislature.maine.gov	House District 74 Rep. Christina Riley 437 Main Street Jay, Maine 04239 Phone (207)897-2288 tina.riley@legislature.maine.gov	2
Town of Leeds 8 Community Drive Leeds, Maine 04263 Phone (207) 524-5171 townofleeds@fairpoint.net	Androscoggin County Commissioners' Office 2 Turner Street, Unit 2 Auburn, Maine 04210 Phone (207) 753-2500, Ext 1801 lpost@androscoggincountymaine.gov	Senate District 22 Senator Garrett Mason PO Box 395 Lisbon Falls, Maine 04252 Phone (207) 557-1521 garret.mason@legislature.maine.gov	House District 75 Rep. Jeffrey L. Timberlake 284 Ricker Hill Road Turner, Maine 07282 Cell Phone (207)754-6000 jeffrey.timberlake@legislature.maine.gov	2
Town of Livermore Falls 2 Main Street Livermore Falls, Maine 04254 Phone (207) 897-3321 townoffice@lfme.org	Androscoggin County Commissioners' Office 2 Turner Street, Unit 2 Auburn, Maine 04210 Phone (207) 753-2500, Ext 1801 lpost@androscoggincountymaine.gov	Senate District 18 Senator Lisa Keim 1505 Main Street Dixfield, ME 04224 Phone (207) 562-6023 Lisa. keim@legislature.maine.gov	House District 74 Rep. Christina Riley 437 Main Street Jay, Maine 04239 Phone (207)897-2288 tina.riley@legislature.maine.gov	2
Town of Moscow 110 Canada Road Moscow, Maine 04920 Phone (207) 672-4834 moscow@myfairpoint.net	Somerset County Commissioners Office 41 Court Street Skowhegan, ME 04976 Phone (207) 474-9861 ddibiasi@SomersetCounty-ME.org	Senate District 3 Senator Rod Whittemore PO Box 96 Skowhegan, Maine 04976 Phone (207) 474-6703 rodney.whittemore@legislature.maine.gov	House District 118 Rep. Chad Wayne Grignon 181 Fox Hill Road Athens, Maine 04912 Phone (207) 654-2771 Cell Phone (207) 612-6499 chad.grignon@legislature.maine.gov	2
Town of New Gloucester 385 Intervale Road New Gloucester, Maine 04260 Phone (207) 926-4126 ccastonguay@newgloucester.com	Cumberland County Commissioners Office James Gailey, County Manager 142 Federal Street Portland, ME 04101 Phone (207) 871-8380	Senate District 20 Senator Eric L. Brakey 146 Pleasant Street Auburn, ME 04210 Phone (207) 406-0897 Eric.brakey@legislature.maine.gov	House District 65 Rep. Ellie Espling 12 Lewiston Rd New Gloucester, Maine 04260 Cell Phone (207) 891-8280 ellie.espling@legislature.maine.gov	1

	gailey@cumberlandcounty.org			
Town of New Sharon 11 School Lane, PO Box 7 New Sharon, Maine 04955-0007 Phone (207) 778-4046 townclerk@newsharon.maine.gov	Franklin County Commissioner's Office 140 Main Street, Suite 3 Farmington, Maine 04938 Phone (207) 778-6614 jmagoon@franklincountymaine.gov	Senate District 17 Senator Thomas Saviello 60 Applegate Lane Wilton, ME 042924 Phone (207) 287-1505 thomas.saviello@legislature.maine.gov	House District 113 Rep. Lance Evans Harvell 398 Knowlton Corner Road Farmington, Maine 04938 Phone (207) 491-8971 lance.harvell@legislature.maine.gov	2
Town of Pownal 429 Hallowell Road Pownal, Maine 04069 Phone (207) 688-4611	Cumberland County Commissioners Office James Gailey, County Manager 142 Federal Street Portland, ME 04101 Phone (207) 871-8380 gailey@cumberlandcounty.org	Senate District 24 Senator Brownie Carson PO Box 68 Harpwell, Maine 04079 Phone (207) 751-9076 Brownie.carson@legislature.maine.gov	House District 46 Rep. Paul B. Chace 31 Colonial Drive Durham, Maine 04222 Phone (207) 240-9300 Paul.chace@legislature.maine.gov House District 48 Rep. Sara Gideon 37 South Freeport Road Freeport, Maine 40032 Phone (207) 287-1300 sara.gideon@legislature.maine.gov	2
Town of Starks 57 Anson Road Starks, Maine 04911 Phone (207) 696-8069 townofstarks@gmail.com	Somerset County Commissioners Office 41 Court Street Skowhegan, ME 04976 Phone (207) 474-9861 ddibiasi@SomersetCounty-ME.org	Senate District 3 Senator Rod Whittemore PO Box 96 Skowhegan, Maine 04976 Phone (207) 474-6703 Rodney.Whittemore@legislature.maine.gov	House District 112 Rep. Thomas H. Skolfield 349 Phillips Road Weld, Maine 04285 Phone (207) 585-2638 thomas.skolfield@legislature.maine.gov	2
Town of Whitefield 36 Townhouse Road Whitefield, Maine 04353 Phone (207) 549-5175 whitefield@roadrunner.com	Lincoln County Commissioners Office 32 High Street, P.O. Box 249 Wiscasset, Maine 04578	Senate District 13 Senator Dana Dow 30 Kalers Pond Road Waldoboro, Maine 04572 Phone (207) 832-4658	House District 88 Rep. Deborah J. Sanderson 64 Whittier Drive Chelsea, Maine 04330 Phone (207) 376-7515	1

	Phone (207) 882-6311 ckipfer@lincounty.me	dana.dow@legislature.maine.gov	deborah.sanderson@legislature.maine.gov	
Town of Wilton 158 Weld Road Wilton, Maine 04294 Phone (207) 645-4961 office@wiltonmaine.org	Franklin County Commissioner's Office 140 Main Street, Suite 3 Farmington, Maine 04938 Phone (207) 778-6614 jmagoon@franklincountymaine.gov	Senate District 17 Senator Thomas Saviello 60 Applegate Lane Wilton, ME 042924 Phone (207) 287-1505 thomas.saviello@legislature.maine.gov	House District 114 Rep. Russell J. Black 123 Black Road Wilton, Maine 04294 Phone (207) 491-4667 russell.black@legislature.maine.gov	2
Town of Windsor 523 Ridge Road, PO Box 179 Windsor, Maine 04363-0179 Phone (207) 445-2998 FAX: 445-3762	Kennebec County Commissioner's Office 125 State Street, 2nd Floor Augusta, Maine 04330 Phone: (207) 622-0971	Senate District 13 Senator Dana Dow 30 Kalers Pond Road Waldoboro, Maine 04572 Phone (207) 832-4658 dana.dow@legislature.maine.gov	House District 80 Rep. Richard T. Bradstreet 44 Harmony Lane Vassalboro, Maine 04989 Cell Phone (207)861-1657 dick.bradstreet@legislature.maine.gov	1
Town of Wiscasset 51 Bath Road Wiscasset, Maine 04578-4108 Phone (207) 882-8200 admin@wiscasset.org	Lincoln County Commissioners Office 32 High Street, P.O. Box 249 Wiscasset, Maine 04578 Phone (207) 882-6311 ckipfer@lincounty.me	Senate District 13 Senator Dana Dow 30 Kalers Pond Road Waldoboro, Maine 04572 Phone (207) 832-4658 dana.dow@legislature.maine.gov	House District 87 Rep. Jeffery P. Hanley 52 Turner Drive Pittston, Maine 04345 Phone (207) 582-1524 Cell Phone (207) 458-9009 jeff.hanley@legislature.maine.gov	1
Town of Woolwich 13 Nequasset Road Woolwich, Maine 04579-9734 PHONE (207) 442-7094	Sagadahoc County Commissioner's Office 752 High Street Bath, Maine 04530 Phone (207) 443-8202	Senate District 23 Senator Eloise Vitelli 73 Newton Road Arrowsic, Maine 04530 Phone (207) 443-4660 eloise.Vitelli@legislature.maine.gov	House District 53 Rep. Jeffrey K. Pierce PO Box 51 Dresden, Maine 04342 Phone (207) 737-9051 Cell (207)441-3006 jeff.pierce@legislature.maine.gov	1

**Appendix B
Service List**

APPLICANT		
Central Maine Power Company	Gerry Mirabile	gerry.mirabile@cmpco.com
	Matt Manahan	mmanahan@pierceatwood.com
	Mark Goodwin	magoodwin@burnsmcd.com
AGENCY CONTACTS		
Department of Environmental Protection	Susanne Miller, Presiding Officer	Susanne.Miller@maine.gov
	Jim Beyer	NECEC.DEP@maine.gov
	Nicholas Livesay	Nick.Livesay@maine.gov
Land Use Planning Commission	Bill Hinkel	bill.hinkel@maine.gov
Maine Department of Inland Fisheries and Wildlife	Bob Stratton	Robert.D.Stratton@maine.gov
Maine Natural Areas Program	Kristen Puryear	Kristen.Puryear@maine.gov
Maine Historic Preservation Commission	Megan Rideout	Megan.M.Rideout@maine.gov
U.S. Army Corps of Engineers	Jay Clement	Jay.L.Clement@usace.army.mil
Department of Energy	Melissa Pauley	Melissa.Pauley@hq.doe.gov
ASSISTANT ATTORNEYS GENERAL		
Maine Office of the Attorney General	Peggy Bensinger	Peggy.Bensinger@maine.gov
	Lauren Parker	Lauren.Parker@maine.gov
DEP ONLY INTERVENORS		
Friends of Boundary Mountains	Robert Weingarten	bpwl@midmaine.com
Maine Wilderness Guides	Nick Leadley	leadley@myfairpoint.net
West Forks Plantation	Ashli Coleman	ashli.goodenow@gmail.com
Old Canada Road	Bob Haynes	oldcanadaroad@myfairpoint.net
Brookfield Renewable	Steven Zuretti	Steven.Zuretti@brookfieldrenewable.com
	Jeffery Talbert	jtalbert@preti.com
The Nature Conservancy	Rob Wood	robert.wood@tnc.org
Conservation Law Foundation	Emily Green	egreen@clf.org
	Phelps Turner	pturner@clf.org
LUPC ONLY INTERVENORS		
Carrie Carpenter ⁽¹⁾		Carrie_carpenter@rocketmail.com
Eric Sherman ⁽¹⁾		eshermanbpr@gmail.com
Kathy Barkley ⁽¹⁾		kbraft@gmail.com
Kim Lyman ⁽¹⁾		klyman9672@gmail.com
Mandy Farrar ⁽¹⁾		manfarr1974@yahoo.com
Matt Wagner ⁽¹⁾		mwagner@insourcerenewables.com

¹ These Intervenor are represented by Elizabeth Beopple, Esq., BCM Environmental & Land Law, PLLC.

LUPC ONLY INTERVENORS		
Noah Hale ⁽¹⁾		1withwhitewaters@gmail.com
Taylor Walker ⁽¹⁾		twalkerfilm@gmail.com
Tony DiBlasi ⁽¹⁾		diblasi.tony@gmail.com
Lewiston Auburn Metropolitan Chamber of Commerce ⁽²⁾		maureen@lametrochamber.com
DEP AND LUPC INTERVENORS		
Mike Pilsbury ⁽¹⁾		mspils15@hotmail.com
Town of Caratunk ⁽¹⁾	Elizabeth Caruso	caratunkselectmen@myfairpoint.net
Kennebec River Anglers ⁽¹⁾	Chris Russell	info@kennebecriverangler.com
Maine Guide Service ⁽¹⁾	Greg Caruso	gcaruso@myfairpoint.net
Edwin Buzzell ⁽¹⁾	Edwin Buzzell	edbuzzel@gmail.com
Industrial Energy Consumer Group	Anthony Buxton	ABuxton@preti.com
	Robert Borowski	RBorowski@preti.com
City of Lewiston ⁽²⁾	Ed Barrett	EBarrett@lewistonmaine.gov
International Brotherhood of Electrical Workers	Anthony Buxton	burgess@ibew104.org
Maine State Chamber of Commerce ⁽²⁾	Dana Connors	Amorin@mainechamber.org
Western Mountains & Rivers Corp.	Ben Smith	bsmith@smithlawmaine.com
NextEra Energy Resources, LLC	Joanna Tourangeau	jtourangeau@dwmlaw.com
	Brian Murphy	Brian.J.Murphy@nexteraenergy.com
	Emily Howe	ehowe@dwmlaw.com
Wagner Forest Management	Mike Novello	mnovello@wagnerforest.com
Hawk's Nest Lodge ⁽¹⁾	Peter Dostie	hawksnestlodge@gmail.com
Appalachian Mountain Club	David Publicover	dpublicover@outdoors.org
Natural Resources Council of Maine	Cathy Johnson	cjohnson@nrcm.org
	Nick Bennett	nbennett@nrcm.org
	Sue Ely	sely@nrcm.org
Trout Unlimited	Jeffery Reardon	Jeffrey.Reardon@tu.org
	David Hedrick	dhedrick@roadrunner.com
Maine Office of the Public Advocate ⁽³⁾	Barry Hobbins	Barry.Hobbins@maine.gov
	Andrew Landry	Andrew.Landry@maine.gov
Elizabeth Boepple, Esq.	BCM Environmental & Land Law, PLLC	boepple@nhlandlaw.com
Gerald F. Petruccelli, Esq.	Petruccelli, Martin & Haddow LLP	gpetruccelli@pmhlegal.com

¹ These Intervenorers are represented by Elizabeth Beopple, Esq., BCM Environmental & Land Law, PLLC.

² These Intervenorers are represented by Gerald F. Petruccelli, Esq., Petruccelli, Martin & Haddow LLP.

³ Maine Office of the Public Advocate is not an Intervenor with the LUPC but, as a governmental agency, may still participate in the LUPC's portion of the NECEC hearing in accordance with Chapter 5, section 5.16. The OPA is an Intervenor in the DEP's hearing.

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Appendix C

Vegetation Management

This appendix describes the four types of vegetation management required along the Segment 1 corridor, which achieve:

- Full canopy height vegetation,
- Vegetation with a 35-foot minimum height,
- Deer travel corridors, and
- Tapered vegetation.

This appendix also describes riparian filter areas adjacent to rivers, streams, and brooks.

Full Canopy Height Vegetation

Full canopy height vegetation is required in three locations along the Segment 1 corridor. The locations, identified more specifically below in Table C-1, include the Gold Brook crossing (which is within Wildlife Area 4), the Mountain Brook crossing (Wildlife Area 6), and the Upper Kennebec River crossing (Wildlife Area 11).

In areas where full canopy height vegetation must be maintained, vegetation will be removed only in areas necessary to access pole locations and place the poles. (There are no pole locations in Wildlife Area 11.) This includes the area within the entire width of the 150-foot wide corridor. Access roads and structure preparation and installation areas will be cleared of all capable and non-capable species and maintained as scrub-shrub habitat to allow for post-construction maintenance, repair, and/or emergency access during operation of the line.

35-Foot Minimum Vegetation Height

In areas where 35-foot tall vegetation must be maintained, only areas necessary to access pole locations or install poles will be cleared during construction. Access roads and structure preparation and installation areas will be cleared of all capable and non-capable species and maintained as scrub-shrub habitat to allow for post-construction maintenance, repair, and/or emergency access during operation of the line. In other areas within the entire width of the corridor only trees taller than 35 feet, or trees that may grow taller than 35 feet prior to the next scheduled maintenance will be removed during construction. Vegetation maintenance within Segment 1 will be on a two- to three-year cycle and may not exceed a three-year cycle within any particular area within this segment without prior approval from the Department.

With regard to ongoing vegetation management, trees that exceed 35 feet or are anticipated to exceed this height before the next scheduled maintenance cycle will be selected and cut at ground level and will only be removed if leaving them will cause a violation of the Maine Slash Law or create a fire or safety hazard.

Deer Travel Corridors

Eight deer travel corridors must be managed as softwood stands to promote deer movement across the transmission line corridor during the winter months when snow depths have the potential to inhibit deer travel. These travel corridors are located on either side of the four structures identified in Table C-1 and will extend along the corridor, under the conductors, where conductor height allows for taller vegetation within the corridor. These deer travel corridors must be managed, designated, and labeled corridors 1 through 8, as softwood stands and allow for the maximum tree height that can practically be maintained without encroaching into the conductor safety zone (approximately 24 feet of clearance between a conductor and the top of vegetation) or into the necessary cleared area adjacent to structures. Tree heights will vary based on structure height, conductor sag, and topography, but must generally range from 25 to 35 feet.

Within designated deer travel corridors 1 through 8, during the initial vegetation clearing for construction all capable hardwood species will be cut and individual softwood specimens will be cut to heights necessary so that they do not intrude into the conductor safety zone and are not at risk of growing into the conductor safety zone prior to the next scheduled vegetation maintenance. On an ongoing basis, softwood specimens that are not intruding into the conductor safety zone and are not at risk of growing into the conductor safety zone prior to the next scheduled vegetation maintenance will be retained. Access roads and structure preparation and installation areas will be cleared of all capable and non-capable species and maintained as scrub-shrub habitat to allow for post-construction maintenance, repair, and/or emergency access during operation of the line.

Table C-1

Area Name	From Structure	To Structure	Location	Min. Veg Height	Notes	Approximate Length (miles)
Wildlife Area 1	3006-800	3006-799	Beattie Twp	35'	Includes Number One Brook not visible from Beattie Pond	0.22
Wildlife Area 2	3006-771	3006-765	Skinner Twp	35'	Includes crossing of the South Branch of the Moose River (all of TNC 2)	1.19
Wildlife Area 3	3006-758	3006-752	Skinner Twp Appleton Twp	35'	Includes five perennial streams and four intermittent streams	1.25
Wildlife Area 4	3006-742	3006-731	Appleton Twp	35' (except full canopy height at Gold Brook crossing)	Includes Gold Brook crossing (structures 3006-735 to 3006-732) and Roaring Brook Mayfly habitat adjacent to that crossing where full canopy height vegetation is required, as well as group of 5 unnamed streams; portions adjacent to Leuthold Preserve	2.18
Wildlife Area 5	3006-708	3006-683	Hobbs town Twp T7 BKP WKR Bradstreet Twp	35'	Includes area near Moose Pond and surrounding land owned by BPL, Whipple Brook crossing, areas adjacent to Leuthold Preserve, and unnamed stream crossing where topography may allow crossing without taller poles (structures 3006-708 to 3006-707)	4.87
Wildlife Area 6	3006-635	3006-633	Johnson Mtn Twp	Full canopy height	Mountain Brook crossing, includes Roaring Brook Mayfly habitat	0.38
Wildlife Area 7	3006-598	3006-597	Johnson Mtn Twp	35'	Cold Stream crossing; adjacent to Cold Stream Forest Tract	0.23
Wildlife Area 8	3006-589	3006-588	Johnson Mtn Twp	35'	Unnamed stream crossing where 35-foot vegetation likely can be maintained without taller poles	0.20
Wildlife Area 9	3006-576	3006-563	West Forks	35'	Includes Tomhegan Stream crossing and adjacent to Cold Stream Forest Tract	2.21
Wildlife Area 10	3006-542	3006-541	Moxie Gore	35'	Moxie Stream crossing where 35-foot vegetation likely can be maintained without taller poles	0.19

Area Name	From Structure	To Structure	Location	Min. Veg Height	Notes	Approximate Length (miles)
Wildlife Area 11	Eastern edge of clearing for the HDD Termination Station in West Forks	Western edge of clearing for the HDD Termination Station in Moxie Gore	West Forks Moxie Gore	Full canopy height	Upper Kennebec River crossing; deer travel corridors 9 and 10	0.56
Wildlife Area 12						
	3006-548		Moxie Gore	25'-35'	Vegetation managed for deer travel in Upper Kennebec River DWA; corridors 7 and 8	0.23
	3006-543		Moxie Gore	25'-35'	Vegetation managed for deer travel in Upper Kennebec River DWA; corridors 5 and 6	0.18
	3006-542		Moxie Gore	25'-35'	Vegetation managed for deer travel in Upper Kennebec River DWA; corridors 3 and 4	0.09
	3006-541		Moxie Gore	25'-35'	Vegetation managed for deer travel in Upper Kennebec River DWA; corridors 1 and 2	0.1

Total distance along the Segment 1 corridor with taller vegetation is approximately 14.08 mile.

Tapered Vegetation

Tapered vegetation is required along the entire Segment 1 corridor, except where full canopy height vegetation, vegetation with a minimum height of 35 feet, or taller vegetation managed for deer travel corridors is required. In Wildlife Area 12 taller vegetation is required for deer travel corridors 1 through 8. Within this wildlife area, tapering is required along the transmission line corridor in the sections outside the deer travel corridors. For example, the section of the transmission line corridor between structures 3006-542 and 3006-543 that is not within a deer travel corridor must be tapered.

“Tapering” refers to a form of vegetation management along the transmission line corridor where increasingly taller vegetation is allowed to grow as the distance from the wire zone increases. Along Segment 1 where tapering is required, the transmission line includes two conductors running parallel to each other and separated by 24 feet. A shield wire runs over each conductor. The wire zone is the 54-foot wide area that runs along the center of the 150-foot wide corridor and includes the 24-foot wide area below and between the two conductors, plus 15 feet on each side of the set of conductors (15 ft. + 24 ft. + 15 ft. = 54 ft.).

In a tapered corridor, within this 54-foot wide wire zone all woody vegetation will be cut to ground level during construction. During maintenance of this portion of the corridor non-capable species are allowed to grow. (Capable species includes vegetation capable of growing tall enough to reach up, into the conductor safety zone). Within a tapered corridor, the result is that within the 54-foot wide wire zone vegetation that is approximately 10 feet tall regenerates so that the wire zone primarily consists of native, scrub-shrub habitat with non-capable species. (Without tapering, the corridor would be cleared and maintained as scrub-shrub habitat across the entire 150-foot width.)

In a tapered corridor, the area outside the wire zone will be selectively cut during construction to create a taper with vegetation approximately 15 feet tall near the wire zone and increasing to approximately 35 feet tall near the edge of the 150-foot wide corridor. The first taper includes the areas within 16 feet of either side of the wire zone, within which vegetation 15 feet tall and under, including capable species, will be maintained. The second taper includes the next 16 feet on either side of the corridor, within which taller vegetation up to 25 feet tall will be maintained. The third and final taper includes the next 16 feet on either side of the corridor, within which even taller vegetation up to 35 feet tall will be maintained.

As vegetation is maintained within a tapered corridor, any trees that exceed the height for the taper they are within or are anticipated to exceed the height before the next scheduled maintenance cycle, will be selected and cut at ground level. Vegetation maintenance within Segment 1 will be on a two- to three-year cycle and may not exceed a three-year cycle within any particular area within this segment without prior approval from the Department. Any trees that are cut will only be removed if leaving them will cause a violation of the Maine Slash Law or create a fire or safety hazard.

The overall result is that a cross section of a 150-foot wide tapered corridor breaks down into the following components:

16' 3rd taper + 16' 2nd taper + 16' 1st taper + 54' wire zone + 16' 1st taper + 16' 2nd taper + 16' 3rd taper = 150' wide corridor. The approximate maximum vegetation height of each taper is:

- 1st taper: 15-foot vegetation
- 2nd taper: 25-foot vegetation
- 3rd taper: 35-foot vegetation

How the vegetation within the tapered areas along Segment 1 is managed will influence the environmental benefit of this form of mitigation. Reasonable steps will be taken to manage the vegetation to ensure tapering minimizes the environmental impact of the corridor to the greatest extent practicable, including reasonable efforts to avoid the growth of even-aged stands within each taper.

Access roads and structure preparation and installation areas will be cleared of all capable and non-capable species and maintained as scrub-shrub habitat to allow for post-construction maintenance, repair, and/or emergency access during operation of the line. Soil disturbance and grading will be minimized through careful planning of temporary access ways. When the temporary access ways are removed, the disturbed areas will be restored to their pre-construction grade and allowed to revegetate. Except for the areas immediately around the base of each transmission line structure, the full width and length of the transmission corridor will remain vegetated following construction of the Project.

Riparian Filter Areas

Unless more restrictive requirements apply,⁴⁵ within 100 feet of all perennial streams in Segment 1, all coldwater fisheries streams in other segments as identified in Appendix E, all streams containing threatened or endangered species, and all Outstanding River Segments; and within 75 feet of all other streams, a riparian filter area will be maintained. Riparian filter areas will be established and maintained in the following manner:

- The boundary of each riparian filter area will have unique flagging installed to distinguish between the applicable 75-foot or 100-foot filter area prior to clearing. Flagging will be maintained throughout construction.
- Foliar herbicides will be prohibited within the riparian filter area,⁴⁶ and all refueling/maintenance of equipment will be excluded from the filter area unless it occurs on an existing paved road or if secondary containment is used with oversight from an environmental inspector.
- All stream crossings by heavy equipment will be performed through the installation of equipment spans with no in-stream disturbances. Streams will not be forded by heavy equipment.
- Initial tree clearing will be performed during frozen ground conditions whenever practicable, and if not practicable, the recommendations of the environmental inspector

⁴⁵ More restrictive requirements include, but are not limited to, requirements to maintain taller vegetation within the corridor such as provided for in Appendix C, Table C-1.

⁴⁶ Additionally, no herbicide will be used in the Segment 1 corridor.

will be followed regarding the appropriate techniques to minimize disturbance, such as the use of selectively placed travel lanes within the riparian filter area. Transmission line structures will not be placed within the riparian filter area, unless specifically authorized by the Department and accompanied by a site-specific erosion control plan. No structures will be placed within 25 feet of any stream regardless of its classification.

- Within that portion of the appropriate riparian filter area that is within the wire zone (i.e., within 15 feet, horizontally, of any conductor), all woody vegetation over 10 feet in height, whether capable or non-capable, will be cut back to ground level and resulting slash will be managed in accordance with Maine's Slash Law. No other vegetation, other than dead or hazard trees, will be removed. Within the riparian filter area and outside of the wire zone, non-capable species may be allowed to exceed 10 feet in height unless it is determined that they may encroach into the conductor safety zone prior to the next maintenance cycle. Vegetation maintenance within Segment 1 will be on a two- to three-year cycle and must not exceed a three-year cycle within any particular area within this segment, without prior approval from the Department. Vegetation maintenance within other segments will be on an approximately four-year cycle.
- Removal of capable species, dead or hazard trees within the appropriate riparian filter area will typically be accomplished by hand-cutting. Use of mechanized harvesting equipment is allowed if supported by construction matting or during frozen conditions in a manner (i.e., use of travel lanes and reach-in techniques) that preserves non-capable vegetation less than 10 feet in height to the greatest extent practicable; within the wire zone, all woody vegetation may be cut to ground level.
- Any construction access roads that must cross streams or brooks must be designed, constructed, and maintained to minimize erosion and sedimentation.

Appendix D Sound Level Requirements

**Table D-1
New Equipment Sound Level Requirements**

Sound Level Requirement		Source
Merrill Road Converter Station		
Reactor/Valve Building (1) Transformers (4) Radiators (10)	66 dBA (SPL) at 3 feet 90 dBA (SWL) per transformer 80 dBA (SWL) per radiator	Site Law Application, Table 5-8
Larrabee Road Substation		
New Autotransformer (3)	82 dBA (SPL) at 3 feet	Site Law Application, Table 5-11
Fickett Road Substation		
Transformer (2) Air Core Reactor – D1 (3) Air Core Reactor – CA1 (3) Capacitor Bank (3) Dry Air Cooler (5) HVAC Fans (2)	91 dBA (SWL) 74 dBA (SWL) 64 dBA (SWL) 71 dBA (SWL) 80 dBA (SWL) 80 dBA (SWL)	Site Law Application, Table 5-15
Coopers Mills Substation		
Transformer (2) Air Core Reactor – D1 (3) Air Core Reactor – CA1 (3) Capacitor Bank (3) Dry Air Cooler (5) HVAC Fans (2)	91 dBA (SWL) 74 dBA (SWL) 64 dBA (SWL) 71 dBA (SWL) 80 dBA (SWL) 80 dBA (SWL)	Site Law Application, Table 5-19
Raven Farm Substation		
Transformer	75 dBA at 6 feet	Raven Farm Substation Sound Study (5/17/18), Table 6-1

Notes:

SPL – Sound Pressure Level, averaged along acoustical envelope

SWL – Sound Power Level

Appendix E Waterbody Crossing Table

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Beattie Twp	ISTR-01-02	Trib. to West Branch Mill Brook	2	INT	N	Y	439	Y	3
1	Skinner Twp	ISTR-08-01	Trib. to West Branch Moose River	4	INT	N	Y	382	Y	20, 21
1	Appleton Twp	WB-16-101	Water body assoc. with trib. to Gold Brook	30	Open Water	N	Y	131	N	3 7
1	Bradstreet Twp	ISTR-24-01	Trib. to Bitter Brook	2	INT	N	N/A	435	Y	5 6
1	Johnson Mountain Twp	ISTR-39-01	Trib. to Cold Stream	4	INT	N	Y	220	N	8 9
1	Johnson Mountain Twp	ISTR-39-03	Trib. to East Branch Salmon Stream	4	INT	N	N/A	274	N	8 8
1	Johnson Mountain Twp	ISTR-42-09	Trib. to Tomhegan Stream	5	INT	N	Y	133	N	9 4
1	West Forks Plt	ISTR-45-02-02	Trib. to Tomhegan Stream	3	INT	N	Y	317	N	10 0
1	West Forks Plt	ISTR-46-05	Trib. to Cold Stream	4	INT	N	Y	43	N	10 3
1	West Forks Plt	ISTR-48-02	Trib. To Kennebec River	3	INT	N	N/A	89	N	108, 109
1	Moxie Gore	ISTR-49-01	Trib. to Moxie Stream	5	INT	N	Y	375	N	11 1
1	Moxie Gore	ISTR-51-07	Trib. to Moxie Stream	2	INT	N	N/A	269	N	11 4
1	Moxie Gore	ISTR-51-15	Trib. to Moxie Stream	1.5	INT	N	N/A	353	N	11 5

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Moxie Gore	ISTR-51-16	Trib. to Moxie Stream	3	INT	N	N/A	320	N	11 5
1	The Forks Plt	ISTR-52-07	Trib. to Moxie Stream	3	INT	N	N/A	394	N	11 6
1	Moxie Gore/The Forks Plt	ISTR-52-08	Trib. to Moxie Stream	1	INT	N	N/A	227	N	11 6
1	The Forks Plt	ISTR-52-12	Trib. to Moxie Stream	2	INT	N	N/A	258	N	116, 117
1	Appleton Twp	ISTR-RR-11-01	Trib. to Bog Brook	5	INT	N	Y	517	N	2 7
1	Appleton Twp/Skinner Twp	ISTR-RR-11-3-RR1	Trib. to Bog Brook	3	INT	N	Y	328	N	2 7
1	Appleton Twp/Skinner Twp	ISTR-RR1-1	Trib. to Bog Brook	5	INT	N	Y	348	N	2 7
1	Appleton Twp	ISTR-RR1-2	Trib. to Bog Brook	2	INT	N	Y	230	N	2 7
1	Beattie Twp	PSTR-00-10	Trib. to West Branch Mill Brook	3	PER	N	Y	21	N	3
1	Skinner Twp	PSTR-09-11	South Branch Moose River	46	PER	N	Y	524	N	2 1
1	Appleton Twp	PSTR-11-07-RR1	Trib. to Bog Brook	6	PER	N	Y	378	N	2 7
1	Appleton Twp	PSTR-11-08-RR1	Trib. to Bog Brook	4	PER	N	Y	353	N	2 7
1	Appleton Twp	PSTR-15-06	Gold Brook	25	PER	N	Y	187	N	3 6
1	Appleton Twp	PSTR-17R-03	Baker Stream	12	PER	N	Y	159	N	3 9
1	T5 R7 BKP WKR	PSTR-23-02	Whipple Brook	60	PER	N	Y	128	N	5 2
1	Bradstreet Twp	PSTR-24-03	Bitter Brook	45	PER	N	Y	462	N	5 5

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Johnson Mountain Twp	PSTR-39-02	Trib. to Cold Stream	2	PER	N	Y	128	N	88, 89
1	Appleton Twp	PSTR-RR1-3	Trib. to Bog Brook	4	PER	N	Y	389	Y	27
1	West Forks Plt/Moxie Gore	PSTR-48-03	Kennebec River	300	PER	N	Y	399	N	109
1	Moxie Gore	STRM-50-01	Moxie Stream	80	PER	N	Y	401	N	113
1	Moxie Gore	ISTR-50-02	Trib. to Moxie Stream	1.5	INT	N	Y	37	N	113
1	Moxie Gore	ISTR-51-01	Trib. to Moxie Stream	80	INT	N	Y	331	N	113
1	Moxie Gore	ISTR-51-02	Trib. to Moxie Stream	5	INT	N	Y	279	N	113
1	Moxie Gore	ISTR-51-03	Trib. to Moxie Stream	4	INT	N	Y	292	N	113
1	Moxie Gore	ISTR-51-04	Trib. to Moxie Stream	2	INT	N	Y	325	N	113
1	Moxie Gore	ISTR-51-05	Trib. to Moxie Stream	8	INT	N	Y	361	N	113
1	Moxie Gore	ISTR-51-06	Trib. to Moxie Stream	3	INT	N	Y	383	N	113, 114
1	Moxie Gore	ISTR-51-08	Trib. to Moxie Stream	1.5	INT	N	Y	244	N	114, 115
1	Moxie Gore	ISTR-51-09	Trib. to Moxie Stream	3	INT	N	Y	267	N	114, 115
1	Moxie Gore	ISTR-51-10	Trib. to Moxie Stream	6	INT	N	Y	312	N	114, 115

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Moxie Gore	ISTR-51-11	Trib. to Moxie Stream	4	INT	N	Y	307	N	114, 115
1	Moxie Gore	ISTR-51-12	Trib. to Moxie Stream	3	INT	N	Y	522	N	114, 115
1	Moxie Gore	ISTR-51-13	Trib. to Moxie Stream	6	INT	N	Y	333	N	115
1	Moxie Gore	ISTR-51-14	Trib. to Moxie Stream	5	INT	N	Y	3	N	115
1	Moxie Gore	ISTR-51-17	Trib. to Moxie Stream	2	INT	N	Y	235	N	115
1	Moxie Gore	ISTR-51-18	Trib. to Moxie Stream	2	INT	N	Y	226	N	115
1	Moxie Gore	ISTR-51-19	Trib. to Moxie Stream	2	INT	N	Y	251	N	115
1	Moxie Gore	ISTR-51-20	Trib. to Moxie Stream	1.5	INT	N	Y	215	N	115
1	Moxie Gore	ISTR-51-21	Trib. to Moxie Stream	3	INT	N	Y	416	N	115
1	Moxie Gore	ISTR-52-01	Trib. to Moxie Stream	5	INT	N	Y	337	N	115, 116
1	Moxie Gore	ISTR-52-02	Trib. to Moxie Stream	3	INT	N	Y	317	N	115, 116
1	Moxie Gore	ISTR-52-03	Trib. to Moxie Stream	3	INT	N	Y	295	N	115, 116
1	Moxie Gore	ISTR-52-04	Trib. to Moxie Stream	5	INT	N	Y	304	N	116
1	Moxie Gore	ISTR-52-05	Trib. to Moxie Stream	5	INT	N	Y	299	N	116

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Moxie Gore	ISTR-52-06	Trib. to Moxie Stream	2	INT	N	Y	379	N	116
1	The Forks Plt	ISTR-52-09	Trib. to Moxie Stream	2	INT	N	Y	192	N	116
1	The Forks Plt	ISTR-52-10	Trib. to Moxie Stream	3	INT	N	Y	62	N	116, 117
1	The Forks Plt	ISTR-52-11	Trib. to Moxie Stream	4	INT	N	Y	195	N	116, 117
1	The Forks Plt	ISTR-52-13	Trib. to Moxie Stream	8	INT	N	Y	518	N	117
1	The Forks Plt	ISTR-52-14	Trib. to Moxie Stream	6	INT	N	Y	419	N	117
1	The Forks Plt	ISTR-52-15	Trib. to Moxie Stream	5	INT	N	Y	486	N	117
1	The Forks Plt	ISTR-52-16	Trib. to Moxie Stream	2	INT	N	Y	288	N	117
1	The Forks Plt	ISTR-52-17	Trib. to Moxie Stream	2	INT	N	Y	399	N	117
1	Beattie Twp	ISTR-00-07	Trib. to West Branch Mill Brook	1	INT	N	Y	408	N	1
1	Beattie Twp	ISTR-01-11	Trib. to Mill Brook	1	INT	N	Y	644	N	5
1	Skinner Twp	ISTR-05-05	Trib. to Smart Brook	1	INT	N	Y	103	N	13
1	Skinner Twp	ISTR-10-04	Trib. to Bog Brook	1	INT	N	Y	108	N	25
1	Appleton Twp	ISTR-12-02	Trib. to Bog Brook	1	INT	N	Y	510	N	29
1	Appleton Twp	ISTR-12-12	Trib. to Bog Brook	1	INT	N	Y	348	N	30

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Appleton Twp	ISTR-14-11	Trib. to Gold Brook	1	INT	N	Y	293	N	34
1	Johnson Mountain Twp	ISTR-41-02	Trib. to Tomhegan Stream	1	INT	N	Y	484	Y	94
1	Johnson Mountain Twp	ISTR-41-04	Trib. to Cold Stream	2	PER	N	Y	342	N	92, 93
1	Beattie Twp	ISTR-01-12	Trib. to Mill Brook	1.5	INT	N	Y	668	N	5
1	Beattie Twp	ISTR-02-09	Trib. to Number One Brook	1.5	INT	N	Y	464	N	7
1	Skinner Twp	ISTR-05-09	Trib. to Smart Brook	1.5	INT	N	Y	99	N	12
1	Skinner Twp	ISTR-06-04	Trib. to Smart Brook	1.5	INT	N	Y	52	N	16
1	Appleton Twp	ISTR-12-09	Trib. to Bog Brook	1.5	INT	N	Y	368	N	28
1	Appleton Twp	ISTR-12-11	Trib. to Bog Brook	1.5	INT	N	Y	321	N	30
1	Appleton Twp	ISTR-14-37	Trib. to Barrett Brook	1.5	INT	N	Y	416	N	33
1	Johnson Mountain Twp	ISTR-33-02	Trib. to Mountain Brook	1.5	INT	N	N/A	214	N	76
1	Johnson Mountain Twp	ISTR-36-05	Trib. to Salmon Stream	1.5	INT	N	N/A	393	N	83
1	Johnson Mountain Twp	ISTR-38-11	Trib. to East Branch Salmon Stream	1.5	INT	N	N/A	144	N	85, 86
1	Johnson Mountain Twp	ISTR-38-13	Trib. to East Branch Salmon Stream	1.5	INT	N	N/A	206	N	85, 86
1	Johnson Mountain Twp	ISTR-38-14	Trib. to East Branch Salmon Stream	1.5	INT	N	N/A	82	N	85, 86

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Beattie Twp	ISTR-02-13	Trib. to Number One Brook	2	INT	N	Y	115	N	7
1	Skinner Twp	ISTR-05-03	Trib. to Smart Brook	2	INT	N	Y	40	Y	13
1	Skinner Twp	ISTR-05-04	Trib. to Smart Brook	2	INT	N	Y	58	N	13
1	Skinner Twp	ISTR-05-10	Trib. to Smart Brook	2	INT	N	Y	336	N	12
1	Skinner Twp	ISTR-06-01	Trib. to Smart Brook	2	INT	N	Y	331	N	16
1	Skinner Twp	ISTR-06-02	Trib. to Smart Brook	2	INT	N	Y	361	N	16
1	Skinner Twp	ISTR-06-03	Trib. to Smart Brook	2	INT	N	Y	249	N	16
1	Skinner Twp	ISTR-06-07	Trib. to Smart Brook	2	INT	N	Y	277	Y	15, 16
1	Skinner Twp	ISTR-07-03	Trib. to West Branch Moose River	2	INT	N	Y	133	N	18
1	Skinner Twp	ISTR-07-04	Trib. to West Branch Moose River	2	INT	N	Y	365	N	18
1	Skinner Twp	ISTR-07-08	Trib. to Hay Bog Brook	2	INT	N	N/A	169	N	17
1	Skinner Twp	ISTR-09-03	Trib. to South Branch Moose River	2	INT	N	Y	549	N	22
1	Skinner Twp	ISTR-09-04	Trib. to South Branch Moose River	2	INT	N	Y	267	N	22

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Skinner Twp	ISTR-09-07	Trib. to South Branch Moose River	2	INT	N	Y	271	N	22, 23
1	Skinner Twp	ISTR-09-08	Trib. to South Branch Moose River	2	INT	N	Y	235	N	23
1	Skinner Twp	ISTR-09-09	Trib. to South Branch Moose River	2	INT	N	Y	183	N	22
1	Skinner Twp	ISTR-10-09	Trib. to Bog Brook	2	INT	N	Y	60	N	25
1	Appleton Twp	ISTR-12-01	Trib. to Bog Brook	2	INT	N	Y	451	N	29
1	Appleton Twp	ISTR-12-05	Trib. to Bog Brook	2	INT	N	Y	380	N	29, 30
1	Appleton Twp	ISTR-13-01	Trib. to Barrett Brook	2	INT	N	Y	166	N	32
1	Appleton Twp	ISTR-13-02	Trib. to Barrett Brook	2	INT	N	Y	149	N	32
1	Appleton Twp	ISTR-13-08	Trib. to Barrett Brook	2	INT	N	Y	485	N	31
1	Appleton Twp	ISTR-13-10	Trib. to Barrett Brook	2	INT	N	Y	90	N	31
1	Appleton Twp	ISTR-13-15	Trib. to Bog Brook	2	INT	N	Y	242	Y	30, 31
1	Appleton Twp	ISTR-13-16	Trib. to Bog Brook	2	INT	N	Y	257	N	30, 31
1	Appleton Twp	ISTR-14-03	Trib. to Gold Brook	2	INT	N	Y	205	N	34
1	Appleton Twp	ISTR-14-04	Trib. to Gold Brook	2	INT	N	Y	170	N	34

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Appleton Twp	ISTR-14-05	Trib. to Gold Brook	2	INT	N	Y	284	N	34
1	Appleton Twp	ISTR-14-08	Trib. to Gold Brook	2	INT	N	Y	194	N	34
1	Appleton Twp	ISTR-14-09	Trib. to Gold Brook	2	INT	N	Y	173	N	34
1	Appleton Twp	ISTR-14-10	Trib. to Gold Brook	2	INT	N	Y	120	N	34
1	Appleton Twp	ISTR-14-23	Trib. to Barrett Brook	2	INT	N	Y	443	N	33
1	Appleton Twp	ISTR-14-27	Trib. to Barrett Brook	2	INT	N	Y	339	N	33
1	Appleton Twp	ISTR-14-45	Trib. to Barrett Brook	2	INT	N	Y	512	N	33
1	Appleton Twp	ISTR-14-46	Trib. to Barrett Brook	2	INT	N	Y	639	N	33
1	Appleton Twp	ISTR-14-51	Trib. to Barrett Brook	2	INT	N	Y	114	N	33
1	Appleton Twp	ISTR-14-62	Trib. to Barrett Brook	2	INT	N	Y	206	Y	32
1	Appleton Twp	ISTR-14-66	Trib. to Barrett Brook	2	INT	N	Y	512	N	32
1	Appleton Twp	ISTR-15-02	Trib. to Gold Brook	2	INT	N	Y	178	Y	35
1	Appleton Twp	ISTR-15-05	Trib. to Gold Brook	2	INT	N	Y	12	N	35
1	Appleton Twp	ISTR-15-09	Trib. to Gold Brook	2	INT	N	Y	223	N	36
1	Appleton Twp	ISTR-15-12	Trib. to Gold Brook	2	INT	N	Y	297	N	36
1	Appleton Twp	ISTR-15-18	Trib. to Gold Brook	2	INT	N	Y	382	N	34
1	Appleton Twp	ISTR-16-16	Trib. to Gold Brook	2	INT	N	Y	52	N	37

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Appleton Twp	ISTR-17-04	Trib. To Rock Pond	2	INT	N	N/A	424	N	40
1	Appleton Twp	ISTR-17R-05	Trib. To Rock Pond	2	INT	N	N/A	554	N	40
1	Parlin Pond Twp	ISTR-30-02	Trib. to Piel Brook	2	INT	N	Y	227	N	69
1	Johnson Mountain Twp	ISTR-35-02	Trib. to Salmon Stream	2	INT	N	N/A	423	N	80
1	Johnson Mountain Twp	ISTR-36-01	Trib. to Salmon Stream	2	INT	N	N/A	379	N	83
1	Johnson Mountain Twp	ISTR-36-04	Trib. to Salmon Stream	2	INT	N	N/A	440	N	83
1	Johnson Mountain Twp	ISTR-38-01	Trib. to East Branch Salmon Stream	2	INT	N	N/A	213	N	87
1	Johnson Mountain Twp	ISTR-38-08	Trib. to East Branch Salmon Stream	2	INT	N	N/A	131	N	86
1	Johnson Mountain Twp	ISTR-38-12	Trib. to East Branch Salmon Stream	2	INT	N	N/A	99	N	85, 86
1	Johnson Mountain Twp	ISTR-41-04	Trib. to Cold Stream	2	INT	N	Y	140	N	92, 93
1	Johnson Mountain Twp	ISTR-42-10	Trib. to Tomhegan Stream	2	INT	N	Y	124	N	94
1	Appleton Twp	ISTR-RR-11-03	Trib. to Bog Brook	2	INT	N	Y	343	N	27
1	Appleton Twp	ISTR-RR-12-01	Trib. to Bog Brook	2	INT	N	Y	174	N	27, 28
1	Bradstreet Twp	ISTR-SR-29-03	Trib. To Fourmile Brook	2	INT	N	N/A	174	N	66

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Appleton Twp	PSTR-14-28	Trib. to Barrett Brook	2	PER	N	Y	142	Y	33
1	Appleton Twp	PSTR-14-34	Trib. to Barrett Brook	2	PER	N	Y	257	N	33
1	Johnson Mountain Twp	PSTR-40-08	Trib. to Cold Stream	2	PER	N	Y	353	N	91
1	Johnson Mountain Twp	PSTR-40-09	Trib. to Cold Stream	2	PER	N	Y	300	N	91
1	Beattie Twp	ISTR-01-10	Trib. to Mill Brook	2.5	INT	N	Y	663	N	5
1	Skinner Twp	ISTR-05-08	Trib. to Smart Brook	2.5	INT	N	Y	163	N	12
1	Johnson Mountain Twp	ISTR-36-02	Trib. to Salmon Stream	2.5	INT	N	N/A	254	Y	82, 83
1	Johnson Mountain Twp	ISTR-37-01	Trib. to East Branch Salmon Stream	2.5	INT	N	N/A	223	N	84
1	Beattie Twp	ISTR-MS-02-10	Trib. to Number One Brook	2.5	INT	N	Y	272	N	7
1	Beattie Twp	PSTR-01-09	Trib. To Mill Brook	2.5	PER	N	Y	726	N	5
1	Beattie Twp	ISTR-00-01	Trib. to West Branch Mill Brook	3	INT	N	Y	402	N	1
1	Beattie Twp	ISTR-00-08	Trib. to West Branch Mill Brook	3	INT	N	Y	176	N	1
1	Beattie Twp	ISTR-02-04	Trib. to Number One Brook	3	INT	N	Y	310	N	7
1	Beattie Twp	ISTR-02-08	Trib. to Number One Brook	3	INT	N	Y	429	N	7

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Skinner Twp	ISTR-05-06	Trib. to Smart Brook	3	INT	N	Y	328	N	12, 13
1	Skinner Twp	ISTR-05-07	Trib. to Smart Brook	3	INT	N	Y	454	N	12, 13
1	Skinner Twp	ISTR-06-05	Trib. to Smart Brook	3	INT	N	Y	152	Y	16
1	Skinner Twp	ISTR-06-08	Trib. to Smart Brook	3	INT	N	Y	65	N	15
1	Skinner Twp	ISTR-07-01	Trib. to West Branch Moose River	3	INT	N	Y	73	N	18, 19
1	Skinner Twp	ISTR-07-07	Trib. to Hay Bog Brook	3	INT	N	N/A	417	N	17
1	Skinner Twp	ISTR-09-10	Trib. to South Branch Moose River	3	INT	N	Y	376	N	21, 22
1	Skinner Twp	ISTR-10-10	Trib. to Bog Brook	3	INT	N	Y	190	N	25
1	Appleton Twp	ISTR-12-04	Trib. to Bog Brook	3	INT	N	Y	408	N	29, 30
1	Appleton Twp	ISTR-14-06	Trib. to Gold Brook	3	INT	N	Y	287	N	34
1	Appleton Twp	ISTR-14-67	Trib. to Barrett Brook	3	INT	N	Y	361	Y	32
1	Appleton Twp	ISTR-15-10	Trib. to Gold Brook	3	INT	N	Y	257	N	36
1	Appleton Twp	PSTR-16-01	Trib. to Baker Stream	25	INT	N	Y	285	N	37
1	Appleton Twp	ISTR-17-02	Trib. to Baker Stream	3	INT	N	N/A	20	Y	39
1	T5 R7 BKP WKR	ISTR-18-08	Trib. to Fish Pond	3	INT	N	N/A	429	N	41, 42
1	T5 R7 BKP WKR/Hobbstown Twp	ISTR-18-11	Trib. to Fish Pond	3	INT	N	N/A	405	N	42

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Bradstreet Twp	ISTR-26-03	Trib. to Horse Brook	3	INT	N	N/A	60	N	60
1	Bradstreet Twp	ISTR-26-04	Trib. to Horse Brook	3	INT	N	N/A	45	N	60
1	Johnson Mountain Twp	ISTR-38-03	Trib. to East Branch Salmon Stream	3	INT	N	N/A	528	N	87
1	Johnson Mountain Twp	ISTR-38-07	East Branch Salmon Stream	3	INT	N	N/A	115	N	86, 87
1	Johnson Mountain Twp	ISTR-42-08	Trib. to Tomhegan Stream	3	INT	N	Y	221	N	94
1	West Forks Plt	ISTR-44-08	Tomhegan Stream	3	INT	N	Y	231	N	100
1	West Forks Plt	ISTR-45-04	Trib. to Tomhegan Stream	3	INT	N	Y	311	N	100, 101
1	Beattie Twp	ISTR-MS-02-08	Trib. to Number One Brook	3	INT	N	Y	359	N	7
1	Beattie Twp	ISTR-MS-02-09	Trib. to Number One Brook	3	INT	N	Y	359	N	7
1	Skinner Twp	ISTR-RR-11-04	Trib. to Bog Brook	3	INT	N	Y	8	N	26
1	Beattie Twp	PSTR-00-06	Trib. to West Branch Mill Brook	3	PER	N	Y	398	N	1
1	Appleton Twp	PSTR-16-10	Trib. to Gold Brook	3	PER	N	Y	313	N	37
1	Appleton Twp	PSTR-16-101	Trib. to Gold Brook	3	PER	N	Y	226	N	37
1	T5 R7 BKP WKR	PSTR-18-15	Trib. to Fish Pond	3	PER	N	Y	198	N	41

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Hobbs town Twp	PSTR-20-01	Trib. to Little Spencer Stream	3	PER	N	Y	443	N	46
1	T5 R7 BKP WKR	PSTR-23-01	Trib. to Whipple Brook	3	PER	N	Y	258	N	52
1	Bradstreet Twp	PSTR-26-05	Trib. to Horse Brook	3	PER	N	Y	298	N	60
1	West Forks Plt	PSTR-44-07	Tomhegan Stream	3	PER	N	Y	37	N	100
1	Beattie Twp	ISTR-MS-02-11	Trib. to Number One Brook	3.5	INT	N	Y	512	N	7
1	Beattie Twp	ISTR-02-01	Trib. to Number One Brook	4	INT	N	Y	505	N	7
1	Skinner Twp	ISTR-08-02	Trib. to West Branch Moose River	4	INT	N	Y	421	N	20, 21
1	Skinner Twp	ISTR-09-05	Trib. to South Branch Moose River	4	INT	N	Y	199	N	22, 23
1	Appleton Twp	ISTR-12-06	Trib. to Bog Brook	4	INT	N	Y	409	N	29, 30
1	Appleton Twp	ISTR-14-01	Trib. to Gold Brook	4	INT	N	Y	328	N	34
1	Appleton Twp	ISTR-16-04	Trib. to Gold Brook	4	INT	N	Y	465	N	37
1	Appleton Twp	ISTR-16-05	Trib. to Gold Brook	4	INT	N	Y	182	N	37
1	T5 R7 BKP WKR	ISTR-18-16	Trib. to Fish Pond	4	INT	N	Y	48	N	41
1	Johnson Mountain Twp	PSTR-31-02	Trib. to Piel Brook	3	INT	N	Y	214	N	68, 69

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Width of Additional Corridor Clearing ⁸ (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Johnson Mountain Twp	ISTR-38-05	Trib. to East Branch Salmon Stream	4	INT	N	N/A	72	150	Y	86, 87
1	Johnson Mountain Twp	ISTR-41-05	Trib. to Cold Stream	4	INT	N	Y	466	150	N	93
1	Johnson Mountain Twp	ISTR-42-02	Trib. to Tomhegan Stream	4	INT	N	Y	279	150	N	96
1	Johnson Mountain Twp	ISTR-42-13	Trib. To Little Wilson Hill Pond	4	INT	N	N/A	329	150	Y	94
1	West Forks Pld	ISTR-45-02	Trib. to Tomhegan Stream	4	INT	N	Y	281	150	N	100
1	Bradstreet Twp	ISTR-SRD1-28-03	Fourmile Brook	4	INT	N	N/A	5	150	Y	63
1	Skinner Twp	PSTR-05-02	Smart Brook	4	PER	N	Y	8	150	N	13
1	Skinner Twp	PSTR-09-06	Trib. to South Branch Moose River	4	PER	N	Y	100	150	N	22, 23
1	Appleton Twp	PSTR-14-30	Trib. to Barrett Brook	4	PER	N	Y	185	150	N	33
1	Appleton Twp	PSTR-14-36	Trib. to Barrett Brook	4	PER	N	Y	329	150	N	33
1	Appleton Twp	PSTR-14-68	Trib. to Barrett Brook	4	PER	N	Y	109	150	Y	32
1	Appleton Twp	PSTR-15-04	Trib. to Gold Brook	4	PER	N	Y	93	150	N	35, 36
1	Appleton Twp	PSTR-16-14	Trib. to Gold Brook	4	PER	N	Y	176	150	N	37
1	T5 R7 BKP WKR/Hobbs Town Twp	PSTR-18-06	Trib. to Fish Pond	4	PER	N	Y	527	150	N	42

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Johnson Mountain Twp	PSTR-38-02	Trib. to East Branch Salmon Stream	4	PER	N	Y	441	N	87
1	Johnson Mountain Twp	PSTR-38-15	Trib. to East Branch Salmon Stream	4	PER	N	Y	146	N	85
1	West Forks Plt	PSTR-44-09	Tomhegan Stream	4	PER	N	Y	440	N	100
1	Bradstreet Twp	PSTR-SR-29-05	Trib. to Piel Brook	4	PER	N	Y	213	N	66, 67
1	Johnson Mountain Twp	ISTR-31-01	Trib. to Piel Brook	5	INT	N	Y	388	N	68
1	Johnson Mountain Twp	ISTR-32-01	Trib. to Piel Brook	5	INT	N	Y	198	N	74
1	Johnson Mountain Twp	ISTR-32-02	Trib. to Piel Brook	5	INT	N	Y	163	N	74
1	Johnson Mountain Twp	ISTR-42-07	Trib. to Tomhegan Stream	5	INT	N	Y	177	N	94
1	Johnson Mountain Twp	ISTR-EM-33-01	Trib. To Twomile Brook	5	INT	N	N/A	170	N	75
1	Johnson Mountain Twp	ISTR-EM-34-03	Trib. To Mountain	5	INT	N	N/A	58	N	77
1	Johnson Mountain Twp	ISTR-EM-34-05	Trib. To Mountain	5	INT	N	N/A	142	N	77
1	Appleton Twp	PSTR-14-24	Trib. to Barrett Brook	5	PER	N	Y	255	Y	33
1	Appleton Twp	PSTR-14-47	Trib. to Barrett Brook	5	PER	N	Y	509	N	33
1	T5 R7 BKP WKR/Hobbstown Twp	PSTR-18-05	Trib. to Fish Pond	5	PER	N	Y	421	Y	42

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	T5 R7 BKP WKR	PSTR-21-02	Trib. to Little Spencer Stream	5	PER	N	Y	454	N	48, 49
1	T5 R7 BKP WKR	PSTR-21-2A	Trib. to Little Spencer Stream	5	PER	N	Y	544	N	48, 49
1	Johnson Mountain Twp	PSTR-40-07	Trib. to Cold Stream	5	PER	N	Y	268	N	91, 92
1	West Forks Plt	PSTR-44-05	Tomhegan Stream	5	PER	N	Y	278	N	100
1	West Forks Plt	PSTR-44-06	Tomhegan Stream	5	PER	N	Y	167	N	100
1	West Forks Plt	PSTR-45-03	Trib. to Tomhegan Stream	5	PER	N	Y	7	Y	100
1	Bradstreet Twp	PSTR-SRD1-02	Trib. to Piel Brook	5	PER	N	Y	274	N	66
1	West Forks Plt	PSTR-45-3	Tomhegan Stream	6	PER	N	Y	249	N	100
1	Skinner Twp	PSTR-05-01	Smart Brook	6	PER	N	N/A	80	N	13
1	Skinner Twp	PSTR-07-02	Trib. to West Branch Moose River	6	PER	N	Y	54	N	18
1	Skinner Twp	PSTR-08-04	Trib. to West Branch Moose River	6	PER	N	Y	27	Y	20
1	Appleton Twp	PSTR-11-07	Trib. to Bog Brook	6	PER	N	Y	583	N	27
1	Appleton Twp	PSTR-14-49	Trib. to Barrett Brook	6	PER	N	Y	458	N	33
1	Johnson Mountain Twp	PSTR-38-06	Trib. to East Branch Salmon Stream	6	PER	N	Y	8	Y	86, 87

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Johnson Mountain Twp	PSTR-38-10	Trib. to East Branch Salmon Stream	6	PER	N	Y	41	N	86
1	Merrill Strip Twp/Beattie Twp	PSTR-LT-1	Trib. to Number One Brook	6	PER	N	Y	190	Y	10
1	Appleton Twp	PSTR-14-33	Trib. to Barrett Brook	7	PER	N	Y	298	N	33
1	Bradstreet Twp	ISTR-27-02	Trib. To Fourmile Brook	8	INT	N	N/A	233	N	61, 62
1	T5 R7 BKP WKR	PSTR-18-14	Trib. to Fish Pond	8	PER	N	Y	123	N	41
1	Johnson Mountain Twp	PSTR-31-06	Trib. to Piel Brook	8	PER	N	Y	100	Y	71
1	Bradstreet Twp	PSTR-SRD1-28-04	Fourmile Brook	8	PER	N	Y	17	N	63
1	Johnson Mountain Twp	PSTR-EM-34-01	Mountain Brook	9	PER	N	Y	31	N	76
1	Appleton Twp	PSTR-12-07	Trib. to Bog Brook	10	PER	N	Y	264	N	28
1	Appleton Twp	PSTR-16-07	Trib. to Gold Brook	10	PER	N	Y	178	N	37
1	Bradstreet Twp	PSTR-26-01	Trib. to Moose River	10	PER	N	Y	326	N	59
1	Johnson Mountain Twp	PSTR-31-SRD2-01	Piel Brook	0	PER	N	Y	239	N	70
1	West Forks Plt	PSTR-45-01	Trib. to Cold stream	10	PER	N	Y	150	N	102
1	West Forks Plt	PSTR-46-04	Trib. To Kennebec River	10	PER	N	Y	201	N	104
1	Appleton Twp	PSTR-11-07-RR1	Trib. to Bog Brook	6	PER	N	Y	583	N	27

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Johnson Mountain Twp	PSTR-SR-31-01	Piel Brook	10	PER	N	Y	219	N	70
1	Bradstreet Twp	PSTR-SRD1-28-01	Fourmile Brook	10	PER	N	Y	6	N	63
1	T5 R7 BKP WKR/Hobbstown Twp	PSTR-21-03	Trib. to Little Spencer Stream	12	PER	N	Y	221	N	48
1	Bradstreet Twp	ISTR-30-01	Piel Brook	1	PER	N	Y	261	N	
1	Johnson Mountain Twp	ISTR-35-02	Trib. to Salmon Stream	2	PER	N	N/A	524	N	80
1	Appleton Twp	ISTR-15-07	Gold Brook	15	INT	N	Y	248	N	36
1	Beattie Twp	PSTR-01-05	Mill Brook	15	PER	N	Y	612	N	4
1	Skinner Twp	PSTR-11-01	Trib. to Bog Brook	15	PER	N	Y	125	N	26
1	Appleton Twp	PSTR-17R-04	Baker Stream	15	PER	N	Y	390	N	39
1	West Forks Plt	PSTR-44-01 (TOB)	Tomhegan Stream	15	PER	N	Y	414	N	100
1	West Forks Plt	PSTR-44-01 EAST	Tomhegan Stream	15	PER	N	Y	290	N	100
1	West Forks Plt	PSTR-44-01 WEST	Tomhegan Stream	15	PER	N	Y	301	N	99, 100
1	West Forks Plt	PSTR-44-02	Tomhegan Stream	15	PER	N	Y	355	N	100
1	West Forks Plt	PSTR-44-04	Tomhegan Stream	15	PER	N	Y	228	N	100
1	Johnson Mountain Twp	PSTR-33-01	Mountain Brook	18	PER	N	Y	33	N	76
1	Appleton Twp	PSTR-17-07	Baker Stream	20	PER	N	Y	354	N	39
1	Appleton Twp	PSTR-16-01	Gold Brook	25	PER	N	Y	32	N	37
1	T5 R7 BKP WKR/Hobbstown Twp	PSTR-21-04	Little Spencer Stream	25	PER	N	Y	358	N	48

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
1	Johnson Mountain Twp	PSTR-40-06	Cold Stream	25	PER	N	Y	391	N	91
1	Bradstreet Twp	PSTR-25-01	Horse Brook	30	PER	N	Y	119	Y	58
1	Johnson Mountain Twp	PSTR-42-03 (TOB)	Trib. to Tomhegan Stream	40	PER	N	Y	121	N	95
2	Bald Mountain Twp T2 R3	ISTR-60-08	Trib. to Joes Hole	2	INT	N	N/A	212	N	133
2	Moscow	ISTR-71-101	Trib. to Austin Stream	1	INT	N	N/A	120	N	158
2	Moscow	ISTR-72-101	Trib. to Chase Stream	3	INT	N	N/A	228	N	159, 160
2	Moscow	ISTR-72-102	Trib. to Chase Stream	3	INT	N	N/A	405	N	159
2	Moscow	ISTR-72-106	Trib. to Chase Stream	2	INT	N	N/A	209	N	160
2	Moscow	ISTR-73-02	Mink Brook	1.5	INT	N	Y	416	N	161
2	Moscow	ISTR-73-03	Mink Brook	2	INT	N	Y	574	N	
2	Moscow	ISTR-73-05	Trib. to Mink Brook	2	INT	N	Y	15	Y	161, 162
2	Moscow	ISTR-73-06	Trib. to Mink Brook	3	INT	N	N/A	20	Y	162
2	Moscow	ISTR-73-07	Mink Brook	3	INT	N	Y	341	N	
2	Moscow	ISTR-73-08	Trib. to Austin Stream	2	INT	N	N/A	461	N	163
2	Bald Mountain Twp T2 R3	POND-59-05	Joes Hole	100	Open Water	N	Y	118	N	131, 132
2	Bald Mountain Twp T2 R3	POND-60-01	Joes Hole	180	Open Water	N	Y	109	N	133, 134
2	The Forks Plt	ISTR-54-01	Trib. to Moxie Pond	9	PER	N	Y	397	N	120

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
2	Moscow	PSTR-71-102	Trib. to Austin Stream	4	PER	N	Y	378	N	157
2	Moscow	PSTR-72-103	Chase Stream	30	PER	N	Y	1	Y	159, 160
2	Moscow	PSTR-72-104	Trib. to Chase Stream	3.5	PER	N	Y	40	N	159, 160
2	Moscow	PSTR-72-105	Trib. to Chase Stream	2	PER	N	Y	124	N	159, 160
2	Moscow	ISTR-73-01	Mink Brook	2	PER	N	Y	139	N	
2	Moscow	ISTR-73-04	Trib. to Mink Brook	2	PER	N	Y	21	N	
2	Moscow	PSTR-74-01	Trib. to Kennebec River	2	PER	N	Y	172	N	164, 165
2	Bald Mountain Twp T2 R3	ISTR-61-05	Trib. to Wild Brook	1	INT	N	N/A	295	N	136
2	The Forks Plt	ISTR-55-03	Trib. to Moxie Pond	1.5	INT	N	N/A	297	N	123
2	Moscow	ESTR-66-12	Trib. to Heald Stream	2	INT	N	N/A	520	N	148, 149
2	The Forks Plt	ISTR-53-01	Trib. to Moxie Pond	2	INT	N	N/A	59	N	119
2	The Forks Plt	ISTR-55-02	Trib. to Moxie Pond	2	INT	N	N/A	274	N	123
2	The Forks Plt	ISTR-56-03	Trib. to Moxie Pond	2	INT	N	N/A	442	N	125
2	Bald Mountain Twp T2 R3	ISTR-63-07	Trib. to Wild Brook	2	INT	N	N/A	467	N	141
2	Bald Mountain Twp T2 R3	PSTR-60-02	Trib. to Baker Stream	2	PER	N	Y	124	Y	135
2	Bald Mountain Twp T2 R3	ISTR-60-05	Trib. to Joes Hole	2.5	INT	N	N/A	119	N	134

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
2	Bald Mountain Twp T2 R3	ISTR-63-05	Trib. to Wild Brook	2.5	INT	N	N/A	446	N	140
2	Bald Mountain Twp T2 R3	ISTR-64-03	Trib. to Wild Brook	2.5	INT	N	N/A	368	N	142, 143
2	Moscow	ISTR-65-04	Trib. to Little Heald Brook	2.5	INT	N	Y	217	N	146
2	Bald Mountain Twp T2 R3	PSTR-60-07	Trib. to Joes Hole	2.5	PER	N	Y	314	N	133
2	Moscow	PSTR-65-03	Little Heald Stream	2.5	PER	N	Y	136	N	146
2	The Forks Plt	ISTR-54-02	Trib. to Moxie Pond	3	INT	N	Y	322	N	120
2	Bald Mountain Twp T2 R3	ISTR-62-01	Trib. to Wild Brook	3	INT	N	N/A	267	N	139
2	Bald Mountain Twp T2 R3	ISTR-62-02	Trib. to Wild Brook	3	INT	N	N/A	342	N	139
2	Bald Mountain Twp T2 R3	ISTR-62-03	Trib. to Wild Brook	3	INT	N	N/A	330	N	140
2	Bald Mountain Twp T2 R3	ISTR-63-08	Trib. to Wild Brook	3	INT	N	N/A	438	N	141
2	Bald Mountain Twp T2 R3	ISTR-63-09	Trib. to Wild Brook	3	INT	N	N/A	322	N	141
2	Bald Mountain Twp T2 R3	ISTR-64-05	Trib. to Wild Brook	3	INT	N	N/A	288	N	142
2	Moscow	ISTR-66-05	Heald Stream	3	INT	N	Y	454	N	147
2	Moscow	PSTR-65-01	Trib. to Little Heald Brook	3	PER	N	Y	119	Y	145
2	Bald Mountain Twp T2 R3	PSTR-61-08	Trib. to Baker Stream	3.5	PER	N	Y	191	N	136

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
2	Moscow	ISTR-66-07	Trib. to Heald Stream	4	INT	N	N/A	238	Y	147
2	Bald Mountain Twp T2 R3	PSTR-60-01	Trib. to Baker Stream	4	PER	N	Y	161	N	135
2	Bald Mountain Twp T2 R3	PSTR-63-06	Trib. to Wild Brook	4	PER	N	Y	333	N	141
2	Bald Mountain Twp T2 R3	PSTR-63-11	Trib. to Wild Brook	4	PER	N	Y	283	N	142
2	Bald Mountain Twp T2 R3	PSTR-64-06	Trib. to Wild Brook	4	PER	N	Y	118	Y	143
2	The Forks Plt	ISTR-57-02	Trib. to Mosquito Stream	5	INT	N	Y	532	N	127
2	Moscow	ISTR-66-08	Trib. to Heald Stream	5	INT	N	Y	416	N	148
2	Moscow	ISTR-66-09	Trib. to Heald Stream	5	INT	N	Y	3	Y	148
2	Moscow	ISTR-66-10	Trib. to Heald Stream	5	INT	N	Y	5	Y	148, 149
2	Bald Mountain Twp T2 R3	PSTR-60-06	Trib. to Joes Hole	5	PER	N	Y	316	N	133
2	Bald Mountain Twp T2 R3	PSTR-61-01	Wild Brook	5	PER	N	Y	511	Y	137
2	Bald Mountain Twp T2 R3	PSTR-64-02	Trib. to Wild Brook	5	PER	N	Y	413	N	142, 143
2	The Forks Plt	ISTR-55-01	Trib. to Moxie Pond	6	INT	N	Y	212	N	123
2	Bald Mountain Twp T2 R3	ISTR-59-02	Trib. to Little Sandy Stream	6	INT	N	Y	16	Y	131

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
2	Moscow	ISTR-66-06	Trib. to Heald Stream	6	INT	N	Y	258	Y	147
2	Moscow	ISTR-67-01	Trib. to Austin Stream	6	INT	N	Y	120	Y	149
2	Bald Mountain Twp T2 R3	PSTR-63-10	Trib. to Wild Brook	6	PER	N	Y	215	N	142
2	Moscow	ISTR-69-01	Trib. to Austin Stream	7	INT	N	Y	155	N	156, 157
2	Bald Mountain Twp T2 R3	PSTR-63-03	Wild Brook	7	PER	N	Y	380	N	140
2	Bald Mountain Twp T2 R3	PSTR-63-04	Wild Brook	7	PER	N	Y	284	N	140
2	Moscow	ISTR-72-107	Trib. to Chase Stream	8	INT	N	Y	66	Y	160
2	The Forks Plt	PSTR-57-01	Mosquito Stream	10	PER	N	Y	470	N	127
2	Bald Mountain Twp T2 R3	PSTR-59-01	Little Sandy Stream	15	PER	N	Y	107	Y	131
2	Moscow	PSTR-66-02	Heald Stream	15	PER	N	Y	459	N	146, 147
2	Moscow	PSTR-65-02	Little Heald Brook	25	PER	N	Y	82	N	146
3	Industry	ISTR-101-01	Trib. to Josiah Brook	5	INT	Y	Y	272	N	223
3	Industry	ISTR-101-02	Trib. to Josiah Brook	2	INT	Y	N/A	219	N	223
3	Industry	ISTR-102-01	Trib. to Josiah Brook	8	INT	Y	Y	294	N	225
3	Industry	ISTR-103-01	Trib. to Goodrich Brook	5	INT	Y	Y	349	N	229

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Industry	ISTR-103-02	Trib. to Goodrich Brook	1.5	INT	Y	N/A	302	N	229
3	Industry	ISTR-103-03	Trib. to Goodrich Brook	3	INT	Y	N/A	72	N	228, 229
3	Industry	ISTR-103-04	Trib. to Goodrich Brook	3	INT	Y	N/A	102	N	228, 229
3	Industry	ISTR-103-05	Trib. to Goodrich Brook	3	INT	Y	N/A	195	N	228
3	Industry	ISTR-103-06	Trib. to Goodrich Brook	1.5	INT	Y	N/A	375	N	228
3	Industry	ISTR-103-07	Trib. to Goodrich Brook	5	INT	Y	Y	330	N	228
3	Industry	ISTR-103-08	Trib. to Goodrich Brook	4	INT	Y	N/A	209	N	227, 228
3	Industry	ISTR-103-09	Trib. to Goodrich Brook	5	INT	Y	Y	274	N	227, 228
3	Farmington	ISTR-107-01	Trib. to Beales Brook	1.5	INT	Y	N/A	299	N	238
3	Farmington	ISTR-108-01	Trib. to Cascade Brook	3	INT	Y	N/A	200	N	240
3	Farmington	ISTR-108-02	Trib. to Cascade Brook	2.5	INT	Y	N/A	246	N	240
3	Farmington	ISTR-108-03	Trib. to Cascade Brook	1.5	INT	Y	N/A	275	N	240
3	Farmington	ISTR-108-04	Trib. to Cascade Brook	1	INT	Y	N/A	196	N	239
3	Farmington	ISTR-111-01	Trib. to Wilson Stream	2	INT	Y	N/A	162	N	246

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Jay	ISTR-114-02	Trib. to Wilson Stream	3	INT	Y	N/A	107	N	253
3	Chesterville	ISTR-114-03	Trib. to Wilson Stream	6	INT	Y	Y	349	Y	253
3	Jay	ISTR-116-02	Trib. To Sugar Brook	8	INT	Y	Y	140	Y	256
3	Jay	ISTR-117-01	Trib. to Fuller Brook	2	INT	Y	N/A	86	Y	259
3	Livermore Falls	ISTR-127-01	Trib. to Androscoggin River	10	INT	N	N/A	411	Y	280, 281
3	Leeds	ISTR-132-02	Trib. To Dead River	3	INT	N	N/A	277	N	292
3	Leeds	ISTR-135-04	Trib. to Allen Stream	4	INT	N	N/A	201	N	299
3	Concord Twp	ISTR-75-03	Trib. to Kennebec River	4	INT	N	N/A	287	Y	167
3	Concord Twp	ISTR-76-02	Trib. to Kennebec River	1	INT	N	N/A	251	N	
3	Concord Twp	ISTR-76-03	Trib. to Kennebec River	20	INT	N	Y	536	N	
3	Concord Twp	ISTR-76-04	Trib. to Kennebec River	2	INT	N	N/A	366	N	
3	Concord Twp	ISTR-76-05	Trib. to Kennebec River	15	INT	N	Y	247	N	
3	Concord Twp	ISTR-76-06	Trib. to Kennebec River	20	INT	N	Y	238	N	
3	Concord Twp	ISTR-77-03	Trib. to Kennebec River	2.5	INT	N	N/A	228	N	171
3	Concord Twp	ISTR-78-01	Trib. To Mill Stream	3	INT	N	N/A	204	Y	173

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Concord Twp	ISTR-78-02	Trib. To Mill Stream	3	INT	N	N/A	254	N	173
3	Concord Twp	ISTR-80-01	Trib. to Kennebec River	2	INT	N	N/A	480	N	177
3	Concord Twp	ISTR-80-02	Trib. to Kennebec River	3	INT	N	N/A	267	N	176
3	Concord Twp	ISTR-80-03	Trib. to Kennebec River	2	INT	N	N/A	93	N	176
3	Concord Twp	ISTR-80-04	Trib. to Kennebec River	1.5	INT	N	N/A	468	N	177
3	Concord Twp	ISTR-80-05	Trib. to Kennebec River	3	INT	N	N/A	247	N	177
3	Concord Twp	ISTR-81-01	Trib. to Kennebec River	4	INT	N	N/A	256	N	178, 179
3	Concord Twp	ISTR-81-02	Trib. to Kennebec River	4	INT	N	N/A	243	N	178, 179
3	Embden	ISTR-82-01	Trib. to Alder Brook	5	INT	N	Y	330	N	182, 183
3	Embden	ISTR-83-02	Trib. to Alder Brook	4	INT	N	N/A	429	N	184
3	Embden	ISTR-83-05	Trib. to Alder Brook	3	INT	N	Y	327	N	184
3	Embden	ISTR-83-06	Trib. to Alder Brook	2	INT	N	Y	281	Y	183, 184
3	Embden	ISTR-84-01	Trib. to Alder Brook	4	INT	N	N/A	312	N	185
3	Embden	ISTR-85-01	Jackin Brook	2	INT	N	Y	232	N	187
3	Starks	ISTR-96-07	Trib. to Pelton Brook	3	INT	Y	N/A	374	N	213
3	Starks	ISTR-96-08	Trib. to Pelton Brook	4	INT	Y	N/A	245	N	213

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Starks	ISTR-96-09	Trib. to Pelton Brook	2	INT	Y	N/A	251	N	213
3	Starks	ISTR-96-10	Trib. to Pelton Brook	5	INT	Y	Y	319	N	213
3	Starks	ISTR-96-11	Trib. to Pelton Brook	2	INT	Y	N/A	335	N	213
3	Starks	ISTR-96-12	Trib. to Pelton Brook	2	INT	Y	N/A	260	N	213
3	Starks	ISTR-97-02	Trib. to Pelton Brook	100	INT	Y	Y	460	N	214, 215
3	Starks	ISTR-97-03	Trib. to Pelton Brook	2.5	INT	Y	N/A	494	N	214, 215
3	Starks	ISTR-97-04	Trib. to Pelton Brook	3	INT	Y	N/A	341	N	214, 215
3	Starks	ISTR-97-06	Trib. to Cold Pond/Hilton Brook	4	INT	Y	N/A	533	N	216
3	Starks	ISTR-97-07	Trib. to Cold Pond/Hilton Brook	2	INT	Y	N/A	562	N	216
3	Starks	ISTR-98-01	Trib. to Lemon Stream	2	INT	Y	N/A	110	N	217, 218
3	Starks	ISTR-99-01	Trib. to Lemon Stream	2	INT	Y	Y	193	N	219
3	Lewiston	ISTR-PERRON-1	Trib. to Stetson Brook	0	INT	N	N/A	353	N	320
3	Farmington	PSTR-112-01	Trib. to Wilson Stream	2	PER	Y	Y	290	N	249

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Chester ville	PSTR-114-01	Trib. to Wilson Stream	8	PER	Y	Y	352	N	253
3	Chester ville	PSTR-114-04	Trib. to Wilson Stream	1	PER	Y	Y	354	N	252
3	Greene	PSTR-141-01	Trib. to Daggett Bog	3	PER	N	N/A	92	N	312
3	Moscow/ Concord Twp	ISTR-75-01	Kennebec River	3	PER	N	Y	218	N	
3	Concord Twp	ISTR-75-02	Trib. to Kennebec River	2	PER	N	Y	206	N	
3	Concord Twp	ISTR-76-01	Trib. to Kennebec River	0	PER	N	Y	192	N	
3	Concord Twp	PSTR-77-01	Trib. to Kennebec River	30	PER	N	Y	209	N	171
3	Concord Twp	PSTR-77-02	Trib. to Kennebec River	2	PER	N	Y	293	N	171
3	Embden	PSTR-83-01	Trib. to Alder Brook	6	PER	N	Y	364	Y	184
3	Embden	PSTR-83-03	Alder Brook	35	PER	N	Y	81	Y	183
3	Embden	PSTR-83-04	Alder Brook	8	PER	N	Y	615	N	184
3	Embden	PSTR-83-07	Trib. to Alder Brook	2.5	PER	N	Y	93	N	183
3	Embden	PSTR-83-08	Trib. to Alder Brook	6	PER	N	Y	107	N	182, 183
3	Anson	PSTR-89-01	Jackin Brook	4.5	PER	N	Y	348	N	196
3	Anson	PSTR-90-02	Carrabassett River	400	PER	N	Y	193	N	199, 200
3	Anson	PSTR-91-01	Gilbert Brook	190	PER	Y	N/A	242	N	201
3	Starks	PSTR-96-01	Trib. to Pelton Brook	20	PER	Y	Y	340	Y	212
3	Starks	PSTR-96-05	Pelton Brook	30	PER	Y	Y	300	N	213

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Starks	PSTR-97-01	Trib. to Pelton Brook	85	PER	Y	Y	125	Y	214
3	Starks	PSTR-97-05	Trib. to Cold Pond/Hilton Brook	20	PER	Y	Y	424	N	216
3	Starks	ISTR-100-01	Trib. To Meadow Brook	2	PER	Y	N/A	499	N	220
3	Starks	ISTR-100-02	Trib. To Meadow Brook	2	INT	Y	N/A	454	N	221
3	Starks	ISTR-100-03	Trib. To Meadow Brook	1	INT	Y	N/A	310	N	221
3	Industry	PSTR-101-03	Trib. to Josiah Brook	6	PER	Y	Y	312	N	223
3	Industry	ISTR-101-04	Trib. to Josiah Brook	4	PER	Y	Y	334	N	223
3	Industry	PSTR-101-05	Josiah Brook	3	PER	Y	Y	208	Y	224
3	Industry	ISTR-101-06	Trib. to Josiah Brook	3	INT	Y	N/A	469	Y	224
3	Industry	ISTR-102-01	Trib. to Josiah Brook	8	PER	Y	Y	216	N	225
3	Industry	ISTR-102-02	Trib. to Josiah Brook	5	INT	Y	Y	270	Y	225
3	Industry	ISTR-102-03	Trib. to Goodrich Brook	3	UNK	Y	N/A	367	N	227
3	Industry	ISTR-103-10	Trib. to Goodrich Brook	4	UNK	Y	N/A	321	N	227
3	Industry	PSTR-103-11	Trib. to Goodrich Brook	7	UNK	Y	Y	349	N	228

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Industry	PSTR-103-12	Goodrich Brook	15	PER	Y	Y	245	N	229
3	Industry	PSTR-103-13	Trib. to Goodrich Brook	7	UNK	Y	Y	104	N	229
3	Industry	PSTR-103-14	Trib. to Goodrich Brook	8	UNK	Y	Y	131	N	229
3	Industry	ISTR-103-15	Trib. to Goodrich Brook	3	UNK	Y	N/A	38	N	227
3	Industry	ISTR-103-16	Trib. to Goodrich Brook	5	UNK	Y	Y	362	N	227
3	Industry	ISTR-104-02	Trib. to Goodrich Brook	4	UNK	Y	N/A	146	N	230
3	Industry	PSTR-104-04	Trib. to Goodrich Brook	6	UNK	Y	Y	135	Y	230
3	New Sharon	PSTR-105-01	Muddy Brook	40	PER	Y	Y	521	N	232
3	Farmington	ISTR-107-01	Trib. to Beales Brook	1.5	UNK	Y	N/A	280	N	238
3	Farmington	PSTR-107-02	Trib. to Beales Brook	3.5	UNK	Y	N/A	116	Y	237
3	Farmington	ISTR-107-03	Trib. to Beales Brook	1	UNK	Y	N/A	275	N	236, 237
3	Farmington	PSTR-107-04	Beales Brook	5	PER	Y	Y	335	N	236
3	Farmington	ISTR-108-05	Trib. to Cascade Brook	1.5	UNK	Y	N/A	29	N	239
3	Farmington	ISTR-108-06	Trib. to Cascade Brook	1.5	UNK	Y	N/A	317	N	239
3	Farmington	ISTR-108-07	Trib. to Cascade Brook	4	UNK	Y	N/A	91	N	239, 240

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Farmington	ISTR-108-08	Trib. to Cascade Brook	1.5	UNK	Y	N/A	62	N	239
3	Farmington	ISTR-108-09	Trib. to Cascade Brook	1	UNK	Y	N/A	404	N	239
3	Farmington	ISTR-109-01	Trib. to Cascade Brook	3	UNK	Y	N/A	162	N	241
3	Farmington	PSTR-109-02	Cascade Brook	8	PER	Y	N/A	113	N	242
3	Farmington	ISTR-109-03	Trib. to Cascade Brook	3	UNK	Y	N/A	386	Y	241
3	Farmington	PSTR-110-	Sandy River	70	PER	Y	Y	136	N	242, 243
3	Farmington	ISTR-111-02	Trib. to Wilson Stream	3.5	UNK	Y	Y	240	N	246, 247
3	Farmington	ISTR-111-03	Trib. to Wilson Stream	4	UNK	Y	Y	51	N	246
3	Farmington	PSTR-112-02	Trib. to Wilson Stream	6	UNK	Y	Y	77	N	247, 248
3	Farmington	PSTR-112-03	Wilson Stream	40	UNK	Y	Y	61	N	247
3	Jay	PSTR-114-01	Trib. to Wilson Stream	8	UNK	Y	Y	169	Y	253
3	Chesterville	PSTR-114-05	Trib. to Wilson Stream	25	UNK	Y	Y	243	Y	252
3	Chesterville	ISTR-114-06	Trib. to Wilson Stream	5	UNK	Y	Y	391	N	252
3	Chesterville	PSTR-114-07	Trib. to Wilson Stream	5	PER	Y	Y	85	Y	252, 253
3	Jay	ISTR-116-03	Trib. to Sugar Brook	2	UNK	Y	N/A	35	Y	256

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Jay	PSTR-116-04	Sugar Brook	3.5	PER	Y	N/A	302	Y	257
3	Jay	PSTR-117-02	Trib. To Fuller Brook	5	UNK	Y	N/A	98	N	258, 259
3	Jay	ISTR-117-03	Trib. To Fuller Brook	4	UNK	Y	N/A	53	N	259
3	Jay	PSTR-117-	Fuller Brook	3	PER	Y	N/A	37	N	260
3	Jay	PSTR-118-	Fuller Brook	15	PER	Y	N/A	492	N	262
3	Jay	PSTR-119-01	James Brook	15	PER	Y	N/A	130	Y	263
3	Embden	ISTR-85-01	Trib. to Jackin Brook	2	UNK	N	Y	175	N	187
3	Anson	ISTR-89-03	Trib. to Fahi Brook	3.5	INT	N	N/A	328	N	196
3	Anson	PSTR-90-01	Trib. to Carrabassett River	5.5	UNK	N	Y	373	N	198
3	Anson	ISTR-90-04	Trib. to Carrabassett River	1.5	UNK	Y	N/A	165	N	200
3	Anson	ISTR-92-01	Trib. to Carrabassett River	2	INT	Y	N/A	332	N	204
3	Anson	ISTR-92-02	Trib. to Carrabassett River	1.5	INT	Y	N/A	307	N	204
3	Anson	PSTR-92-03	Gilman Brook	20	UNK	Y	Y	305	N	205
3	Anson	ISTR-92-05	Trib. to Gilman Brook	4.5	UNK	Y	N/A	365	N	205
3	Anson	PSTR-93-01	Getchell Brook	15	INT	Y	N/A	59	N	207, 208
3	Anson	ISTR-93-02	Trib. to Getchell Brook	4	INT	Y	N/A	162	N	208
3	Anson	PSTR-93-03	Trib. to Getchell Brook	2	UNK	Y	N/A	413	N	208

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Anson	ISTR-95-01	Trib. to Kennebec River	2.5	INT	Y	N/A	123	N	209, 210
3	Anson	ISTR-95-02	Trib. to Kennebec River	6	INT	Y	Y	416	N	209, 210
3	Anson	ISTR-95-03	Trib. to Kennebec River	1	UNK	Y	N/A	504	N	210
3	Anson	ISTR-95-04	Trib. to Kennebec River	1	UNK	Y	N/A	412	N	210
3	Starks	PSTR-95-05	Trib. to Kennebec River	2	UNK	Y	N/A	119	N	210
3	Starks	PSTR-99-02	Trib. to Lemon Stream	6	UNK	Y	Y	43	Y	219
3	Starks	ISTR-99-03	Trib. to Lemon Stream	1	UNK	Y	Y	128	Y	219
3	Starks	ISTR-99-04	Trib. to Lemon Stream	3	UNK	Y	Y	125	N	219
3	Starks	PSTR-99-05	Lemon Stream	55	PER	Y	Y	116	N	219, 220
3	Starks	PSTR-99-06	Trib. to Lemon Stream	6	UNK	Y	Y	406	N	219
3	Starks	ISTR-99-07	Lemon Stream	1	UNK	Y	Y	206	N	220
3	Anson	WB-94-01	Trib. to Getchell Brook	85	Open Water	Y	N/A	299	N	208
3	Anson	ISTR-88-01	Trib. to Fahi Brook	1	INT	N	N/A	444	N	196
3	Industry	ISTR-104-01	Trib. to Goodrich Brook	2	INT	Y	N/A	426	N	229
3	Livermore Falls	ISTR-123-03	Trib. to Clay Brook	4	INT	N	N/A	150	N	272

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Livermore Falls	ISTR-128-02	Trib. to Androscoggin River	2	INT	N	N/A	196	N	283
3	Livermore Falls	ISTR-128-03	Trib. to Androscoggin River	2	INT	N	N/A	157	N	283
3	Leeds	ISTR-135-02	Trib. to Allen Stream	2	INT	N	N/A	54	N	299
3	Leeds	ISTR-135-03	Trib. to Allen Stream	2	INT	N	N/A	153	N	299, 300
3	Greene	ISTR-139-03	Trib. to Allen Pond	2	INT	N	N/A	366	N	309
3	Greene	ISTR-140-02	Trib. to Allen Pond	1.5	INT	N	N/A	228	N	309
3	Greene	ISTR-140-07	Trib. to Allen Pond	2	INT	N	N/A	153	N	310, 311
3	Lewiston	ISTR-145-02	Trib. to Stetson Brook	2	INT	N	Y	157	N	322
3	Lewiston	ISTR-145-03	Trib. to Stetson Brook	8	INT	N	N/A	170	N	321
3	Lewiston	ISTR-146-04	Trib. to Stetson Brook	2	INT	N	Y	482	N	323
3	Starks	ISTR-96-03	Trib. to Pelton Brook	2	INT	Y	N/A	186	N	212
3	Livermore Falls	PSTR-121-03	Trib. to Clay Brook	2	PER	N	N/A	318	N	269
3	Livermore Falls	PSTR-122-04	Trib. to Clay Brook	2	PER	N	N/A	271	N	269, 270
3	Livermore Falls	PSTR-122-05	Trib. to Clay Brook	6	PER	N	N/A	295	N	269
3	Livermore Falls	PSTR-122-06	Trib. to Clay Brook	2	PER	N	N/A	250	N	269
3	Livermore Falls	PSTR-125-01	Trib. to Androscoggin River	2	PER	N	N/A	303	N	276

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Leeds	PSTR-135-01	Trib. to Allen Stream	2	PER	N	N/A	333	N	299
3	Greene	PSTR-144-02	Trib. to Daggett Bog	2	PER	N	N/A	76	N	319
3	Livermore Falls	ISTR-125-06	Trib. to Androscoggin River	2	UNK	N	N/A	244	N	277
3	Livermore Falls	ISTR-126-06	Trib. to Androscoggin River	2	UNK	N	N/A	422	N	279
3	Leeds	ISTR-134-01	Trib. to Allen Stream	2	UNK	N	N/A	131	N	298
3	Leeds	ISTR-134-02	Trib. to Allen Stream	2.5	INT	N	N/A	116	N	297
3	Leeds	ISTR-134-03	Trib. to Allen Stream	2.5	INT	N	N/A	51	N	297
3	Jay	ISTR-121-01	Trib. to Clay Brook	3	INT	N	N/A	227	N	268
3	Livermore Falls	ISTR-123-02	Trib. to Clay Brook	3	INT	N	N/A	146	N	272
3	Livermore Falls	ISTR-124-01	Trib. to Androscoggin River	3	INT	N	N/A	279	N	274
3	Livermore Falls	ISTR-124-02	Trib. to Androscoggin River	3	INT	N	N/A	459	N	274
3	Livermore Falls	ISTR-126-01	Trib. to Androscoggin River	3	INT	N	N/A	297	N	279
3	Livermore Falls	ISTR-127-03	Trib. to Hunton Brook	30	INT	N	N/A	539	N	282
3	Leeds	ISTR-130-02	Trib. to Androscoggin River	3	INT	N	N/A	58	N	287

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Leeds	ISTR-130-03	Trib. to Androscoggin River	3	INT	N	N/A	330	Y	287, 288
3	Leeds	ISTR-131-02	Trib. To Dead River	3	INT	N	N/A	142	N	291
3	Leeds	ISTR-132-01	Trib. To Dead River	3	INT	N	N/A	190	N	292
3	Greene	ISTR-138-03	Trib. to Allen Stream	3	INT	N	N/A	295	N	306
3	Greene	ISTR-140-04	Trib. to Allen Pond	3	INT	N	N/A	215	N	309
3	Greene	ISTR-140-05	Trib. to Allen Pond	3	INT	N	N/A	199	N	309
3	Starks	ISTR-96-04	Trib. to Pelton Brook	3	INT	Y	N/A	524	N	212
3	Jay/Livermore Falls	PSTR-121-02	Trib. to Clay Brook	3	PER	N	N/A	138	N	268, 269
3	Jay	PSTR-121-04	Trib. to Clay Brook	3	PER	N	N/A	92	N	267, 268, 269
3	Livermore Falls	PSTR-128-01	Trib. to Androscoggin River	3	PER	N	N/A	108	Y	282, 283
3	Leeds	PSTR-133-01	Trib. to Allen Stream	3	PER	N	N/A	113	Y	295
3	Starks	PSTR-96-02	Trib. to Pelton Brook	3	PER	Y	Y	334	N	212
3	Livermore Falls	ISTR-123-01	Trib. to Clay Brook	4	INT	N	N/A	110	N	272
3	Livermore Falls	PSTR-125-02	Trib. to Androscoggin River	2	INT	N	N/A	295	Y	277
3	Livermore Falls	ISTR-125-05	Trib. to Androscoggin River	4	INT	N	N/A	319	N	277
3	Leeds	ISTR-131-01	Trib. to Dead River	4	INT	N	N/A	15	Y	289
3	Greene	ISTR-138-01	Trib. to Allen Pond	4	INT	N	N/A	24	N	307

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Greene	ISTR-138-02	Trib. to Allen Pond	4	INT	N	N/A	194	N	307
3	Greene	ISTR-140-03	Trib. to Allen Pond	6	INT	N	N/A	174	Y	310
3	Greene	ISTR-141-02	Trib. to Daggett Bog	4	INT	N	N/A	200	N	312
3	Livermore Falls	PSTR-126-02	Trib. to Androscoggin River	4	PER	N	N/A	333	N	279
3	Livermore Falls	PSTR-126-05	Trib. to Androscoggin River	4	PER	N	N/A	346	N	279
3	Livermore Falls	PSTR-127-02	Trib. To Hunton Brook	30	PER	N	N/A	426	N	281
3	Greene	PSTR-139-01	Trib. to Allen Stream	4	PER	N	N/A	351	Y	307
3	Greene	PSTR-139-02	Trib. to Allen Stream	4	PER	N	N/A	373	N	307
3	Greene	PSTR-140-06	Trib. to Allen Pond	4	PER	N	N/A	354	N	310
3	Greene	PSTR-140-08	Trib. to Allen Pond	4	PER	N	N/A	139	Y	309
3	Greene	PSTR-140-09	Trib. to Allen Pond	4	PER	N	N/A	142	N	309
3	Lewiston	PSTR-145-01	Trib. to Stetson Brook	4	PER	N	Y	8	Y	321, 322
3	Anson	PSTR-89-02	Trib. to Fahi Brook	5	PER	N	N/A	503	N	196
3	Livermore Falls	PSTR-122-02	Trib. to Clay Brook	5	PER	N	N/A	208	N	270
3	Livermore Falls	PSTR-122-03	Clay Brook/Redwater Brook	5	PER	N	N/A	60	N	270, 271
3	Livermore Falls	PSTR-126-03	Trib. to Androscoggin River	5	PER	N	N/A	141	N	280

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
3	Lewiston	PSTR-146-03	Trib. to Androscoggin River	2	PER	N	N/A	419	N	323
3	Lewiston	PSTR-146-05	Trib. to Androscoggin River	1	PER	N	N/A	35	N	323
3	Starks	PSTR-96-06	Pelton Brook	5	PER	Y	Y	336	N	213
3	Leeds	PSTR-136-01	Trib. to Androscoggin River	6	PER	N	N/A	194	Y	302
3	Greene	PSTR-140-01	Allen Stream	6	PER	N	N/A	323	N	310
3	Greene	PSTR-143-01	Stetson Brook	6	PER	N	N/A	26	Y	318
3	Greene	PSTR-144-01	Trib. to Stetson Brook	6	PER	N	Y	32	Y	318
3	Livermore Falls	ISTR-126-04	Trib. to Androscoggin River	3	INT	N	N/A	132	Y	280
3	Leeds	ISTR-130-01	Trib. to Dead River	8	INT	N	N/A	296	N	289
3	Leeds	PSTR-130-	Dead River	60	INT	N	N/A	91	N	289
3	Livermore Falls	PSTR-122-01	Trib. to Clay Brook	5	PER	N	N/A	466	N	269, 270
3	Livermore Falls	PSTR-122-07	Trib. to Clay Brook	5	PER	N	N/A	311	N	270
3	Greene	PSTR-143-02	Stetson Brook	10	PER	N	N/A	210	N	318
3	Livermore Falls	PSTR-125-03	Trib. to Androscoggin River	2	PER	N	N/A	42	N	277, 278
3	Livermore Falls	PSTR-125-04	Trib. to Androscoggin River	4	PER	N	N/A	191	N	277, 278
3	Livermore Falls	PSTR-129-01	Scott Brook	20	PER	N	N/A	166	N	285, 286
3	Livermore Falls	PSTR-127-04	Hunton Brook	4	PER	N	N/A	106	N	281

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
4	Lewiston	ISTR-153-01	Trib. to Androscoggin River	3	UNK	Y	N/A	120	N	340
4	Durham	ISTR-156-02	Trib. to Androscoggin River	1	INT	Y	N/A	103	N	346
4	Durham	ISTR-158-01	Trib. to Libby Brook	15	INT	N	N/A	143	N	351
4	Durham	ISTR-158-02	Trib. to Libby Brook	2	INT	N	N/A	134	N	351
4	Lewiston	ISTR-155-01	Trib. to Androscoggin River	2	INT	Y	N/A	127	N	343
4	Durham	ISTR-157-01	Trib. to House Brook	1.5	INT	Y	N/A	116	Y	348
4	Pownal	ISTR-161-04	Trib. to Runaround Brook	6	INT	N	N/A	66	N	
4	Auburn	PSTR-156-01	Trib. to Androscoggin River	2	PER	Y	N/A	211	N	345
4	Auburn	PSTR-156-03	Trib. to Androscoggin River	1	PER	Y	N/A	91	N	346
4	Auburn	PSTR-156-04	Trib. to Androscoggin River	2	PER	Y	N/A	165	Y	345
4	Auburn	PSTR-156-05	Trib. to Androscoggin River	2	PER	Y	N/A	90	N	346
4	Auburn	PSTR-156-06	Trib. to Androscoggin River	2	PER	Y	N/A	178	N	345
4	Auburn	PSTR-156-07	Trib. to Androscoggin River	2	PER	Y	N/A	85	N	346
4	Durham	PSTR-157-02	House Brook	2	PER	Y	N/A	105	Y	348

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
4	Lewiston	ISTR-150-02	Trib. to No Name Brook	3	INT	Y	N/A	197	Y	333
4	Pownal	ISTR-161-02	Trib. to Runaround Brook	3	INT	N	N/A	117	Y	356
4	Lewiston	PSTR-146-01	Trib. to Stetson Brook	4	PER	N	Y	87	N	324
4	Lewiston	PSTR-146-02	Trib. to Stetson Brook	4	PER	N	Y	144	N	324
4	Lewiston	PSTR-152-01	Trib. to No Name Brook	3	PER	Y	N/A	58	N	337
4	Lewiston	PSTR-147-01	Trib. to No Name Brook	3.5	PER	Y	N/A	80	Y	326, 327
4	Lewiston	PSTR-148-01	Trib. to No Name Pond	3.5	PER	Y	N/A	87	Y	329
4	Lewiston	ISTR-150-01	Trib. to No Name Brook	4	INT	Y	N/A	106	Y	332
4	Lewiston	PSTR-148-02	Trib. to No Name Pond	4.5	PER	Y	N/A	81	Y	329
4	Pownal	PSTR-161-01	Runaround Brook	5	PER	N	N/A	15	N	358
4	Pownal	PSTR-161-03	Runaround Brook	5	PER	N	N/A	472	N	358
4	Auburn	PSTR-155-02	House Brook	8	PER	Y	N/A	160	N	345
4	Durham	PSTR-160-01	Runaround Brook	9	PER	N	N/A	108	Y	355
4	Durham	PSTR-160-03	Trib. to Runaround Brook	12	PER	N	N/A	105	N	355
4	Durham	PSTR-158-03	Libby Brook	15	PER	N	N/A	47	Y	351, 352
4	Lewiston	PSTR-151-01	No Name Brook	25	PER	Y	N/A	83	N	334, 335
4	Lewiston	PSTR-147-02	Stetson Brook	50	PER	N	Y	86	N	325
4	Lewiston	PSTR-149-01	No Name Brook	50	PER	Y	N/A	90	N	330
4	Auburn/ Lewiston	PSTR-155-03	Androscoggin River	645	PER	Y	N/A	104	N	344

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
5	Wiscasset	ISTR-183-01	Trib. to Montsweag Brook	2	INT	Y	N/A	140	N	370
5	Wiscasset	ISTR-188-09	Trib. to Back River/Montsweag Bay	3	INT	Y	N/A	15,281	N	359
5	Whitefield	PSTR-171-01	Trib. to Sheepscot River	40	PER	Y	Y	355	Y	397
5	Whitefield	PSTR-172-02	Trib. to Sheepscot River	20	PER	Y	Y	101	N	395
5	Whitefield	ISTR-166-01	Trib. To Finn Brook	2	UNK	Y	N/A	140	N	408
5	Whitefield	PSTR-166-	Finn Brook	5	PER	Y	Y	395	Y	408
5	Whitefield	PSTR-168-01	East Branch Eastern River	11	PER	Y	N/A	206	N	403
5	Whitefield	PSTR-168-02	East Branch Eastern River	3	PER	Y	N/A	58	Y	403
5	Whitefield	PSTR-169-01	East Branch Eastern River	5	PER	Y	N/A	149	Y	402
5	Whitefield	ISTR-169-02	Trib. to East Branch Eastern River	2	UNK	Y	N/A	296	N	402
5	Whitefield	ISTR-169-03	Trib. to East Branch Eastern River	2	UNK	Y	N/A	178	Y	402
5	Whitefield	ISTR-169-04	Trib. to East Branch Eastern River	1	UNK	Y	N/A	136	N	402
5	Whitefield	PSTR-170-01	East Branch Eastern River	9	PER	Y	N/A	189	Y	399, 400

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
5	Whitefield	ISTR-170-02	Trib. to East Branch Eastern River	2	INT	Y	N/A	129	N	400
5	Whitefield	PSTR-172-01	Trib. to Sheepscot River	6	PER	Y	Y	226	N	394
5	Whitefield	PSTR-172-03	Trib. to Sheepscot River	2	UNK	Y	N/A	320	N	396
5	Whitefield	ISTR-173-01	Trib. to Sheepscot River	3	UNK	Y	N/A	285	Y	392
5	Whitefield	PSTR-174-01	Trib. to Sheepscot River	6	PER	Y	Y	333	Y	391
5	Whitefield	ISTR-174-02	Trib. to Sheepscot River	3	UNK	Y	Y	385	Y	391
5	Whitefield	PSTR-174-03	Trib. to Sheepscot River	7	PER	Y	Y	366	Y	389
5	Whitefield	ISTR-174-04	Trib. to Sheepscot River	1	UNK	Y	Y	366	N	389
5	Whitefield	ISTR-175-01	Trib. to Sheepscot River	1	UNK	Y	N/A	218	Y	388
5	Whitefield	PSTR-175-02	Trib. to Sheepscot River	3	UNK	Y	Y	201	Y	388
5	Alna	PSTR-176-01	Trib. to Sheepscot River	5	INT	Y	Y	209	Y	387
5	Alna	PSTR-177-01	Trib. to Trout Brook	25	PER	Y	Y	107	N	383
5	Alna	PSTR-178-	Trout Brook	8	PER	Y	Y	264	N	381, 382
5	Alna	PSTR-178-	Trout Brook	15	PER	Y	Y	133	N	381, 382
5	Alna	PSTR-179-02	Trib. to Trout Brook	6	INT	Y	N/A	119	Y	379, 380
5	Alna	PSTR-179-03	Trib. to Trout Brook	6	PER	Y	Y	198	N	379

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
5	Alna	ISTR-180-01	Trib. to Trout Brook	1	INT	Y	N/A	112	N	377
5	Wiscasset	ISTR-181-01	Trib. to Ward Brook	3	UNK	Y	N/A	82	Y	374
5	Wiscasset	ISTR-181-02	Ward Brook	2	UNK	Y	N/A	114	Y	374, 375
5	Wiscasset	ISTR-182-01	Trib. Ward Brook	4	UNK	Y	N/A	247	N	373
5	Wiscasset	PSTR-183-02	Trib. to Montsweag Brook	0.5	UNK	Y	N/A	39	Y	370
5	Wiscasset	ISTR-183-03	Trib. to Montsweag Brook	2	UNK	Y	N/A	94	N	370
5	Wiscasset	ISTR-184-01	Trib. to Montsweag Brook	1.5	INT	Y	N/A	140	N	369
5	Woolwich	ISTR-184-02	Trib. to Montsweag Brook	2.5	UNK	Y	N/A	318	Y	367
5	Woolwich	ISTR-184-03	Trib. To Montsweag Brook	150	UNK	Y	N/A	113	N	367, 368
5	Woolwich	ISTR-184-04	Trib. to Montsweag Brook	2.5	UNK	Y	N/A	209	Y	367, 368
5	Wiscasset	ISTR-184-05	Trib. to Montsweag Brook	3	UNK	Y	N/A	253	N	369
5	Wiscasset	ISTR-184-06	Trib. to Montsweag Brook	2	UNK	Y	N/A	195	N	369
5	Wiscasset	ISTR-184-08	Montsweag Brook	25	UNK	Y	N/A	55	Y	369
5	Wiscasset	ISTR-184-09	Montsweag Brook	30	PER	Y	N/A	45	N	368, 369
5	Wiscasset	ISTR-184-10	Montsweag Brook	2.5	PER	Y	N/A	66	N	368
5	Woolwich	ISTR-185-02	Trib. to Montsweag Brook	2.5	UNK	Y	N/A	28	N	366

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
5	Woolwich	ISTR-185-03	Trib. to Montsweag Brook	1	UNK	Y	N/A	23	N	366
5	Woolwich	ISTR-185-04	Trib. to Montsweag Brook	1	UNK	Y	N/A	37	N	366
5	Woolwich	ISTR-185-05	Trib. to Montsweag Brook	1	UNK	Y	N/A	62	Y	366
5	Woolwich	ISTR-185-06	Trib. to Montsweag Brook	3	UNK	Y	N/A	312	N	
5	Wiscasset	ISTR-186-02	Trib. to Chewonki Creek	1	INT	Y	N/A	4,335	N	364
5	Wiscasset	ISTR-187-01	Trib. to Chewonki Creek	2.5	INT	Y	N/A	6,250	N	363
5	Wiscasset	ISTR-187-02	Trib. to Chewonki Creek	1.5	INT	Y	N/A	6,262	N	363
5	Wiscasset	ISTR-187-03	Trib. to Chewonki Creek	1.5	INT	Y	N/A	6,300	N	363
5	Wiscasset	ISTR-187-05	Trib. to Chewonki Creek	1	INT	Y	N/A	6,728	N	362, 363
5	Wiscasset	ISTR-187-07	Trib. to Chewonki Creek	1	INT	Y	N/A	7,099	N	362
5	Wiscasset	ISTR-187-15	Trib. to Back River/ Monstweag Bay	1	INT	Y	N/A	10,413	N	361
5	Wiscasset	ISTR-187-16	Trib. to Back River/ Monstweag Bay	1	INT	Y	N/A	10,248	N	361
5	Wiscasset	ISTR-187-17	Trib. to Back River/ Monstweag Bay	1	INT	Y	N/A	10,265	N	361

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
5	Wiscasset	ISTR-187-18	Trib. to Back River/ Monstweag Bay	1	INT	Y	N/A	10,246	N	361
5	Wiscasset	ISTR-187-22	Trib. to Chewonki Creek	1	INT	Y	N/A	7,549	N	362
5	Wiscasset	ISTR-187-23	Trib. to Back River/ Monstweag Bay	2.5	INT	Y	N/A	10,710	N	361
5	Wiscasset	ISTR-188-05	Trib. to Back River/ Monstweag Bay	1	INT	Y	N/A	11,591	N	360
5	Wiscasset	ISTR-188-06	Trib. to Back River/ Monstweag Bay	1	INT	Y	N/A	11,601	N	360
5	Wiscasset	ISTR-186-03	Trib. to Chewonki Creek	1.5	INT	Y	N/A	3,628	Y	364
5	Wiscasset	ISTR-186-04	Trib. to Chewonki Creek	1.5	INT	Y	N/A	3,810	Y	364
5	Wiscasset/Woolwich	ISTR-186-06	Trib. to Montsweag Brook	1.5	INT	Y	N/A	1,334	N	365
5	Wiscasset	ISTR-187-13	Trib. to Chewonki Creek	2	INT	Y	N/A	7,645	N	362
5	Wiscasset	ISTR-187-20	Trib. to Chewonki Creek	1.5	INT	Y	N/A	9,419	N	361
5	Wiscasset	ISTR-187-21	Trib. to Chewonki Creek	1.5	INT	Y	N/A	9,380	N	361
5	Wiscasset	PSTR-187-19	Trib. to Chewonki Creek	1.5	PER	Y	N/A	9,386	N	361

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
5	Wiscasset	PSTR-187-24	Trib. to Chewonki Creek	1.5	PER	Y	N/A	8,911	N	361, 362
5	Windsor	ISTR-162-03	Trib. to West Branch Sheepscot River	2	INT	Y	N/A	339	N	417
5	Windsor	ISTR-162-04	Trib. to West Branch Sheepscot River	2	INT	Y	N/A	566	N	417
5	Windsor	ISTR-162-05	Trib. to West Branch Sheepscot River	2	INT	Y	N/A	628	N	417
5	Windsor	ISTR-162-08	Trib. to West Branch Sheepscot River	2	INT	Y	N/A	1,664	N	
5	Wiscasset	ISTR-187-06	Trib. to Chewonki Creek	2	INT	Y	N/A	8,231	N	362
5	Wiscasset	ISTR-187-08	Trib. to Chewonki Creek	2	INT	Y	N/A	7,599	N	362
5	Wiscasset	ISTR-187-09	Trib. to Chewonki Creek	2	INT	Y	N/A	7,709	N	362
5	Wiscasset	ISTR-187-10	Trib. to Chewonki Creek	2	INT	Y	N/A	7,607	N	362
5	Wiscasset	ISTR-187-11	Trib. to Chewonki Creek	2	INT	Y	N/A	7,490	N	362
5	Wiscasset	ISTR-187-12	Trib. to Chewonki Creek	2	INT	Y	N/A	7,409	N	362

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
5	Wiscasset	ISTR-187-14	Trib. to Chewonki Creek	2	INT	Y	N/A	7,906	N	362
5	Wiscasset	ISTR-188-02	Trib. to Back River/ Monstweag Bay	2	INT	Y	N/A	14,492	N	359
5	Wiscasset	ISTR-188-03	Trib. to Back River/ Monstweag Bay	2	INT	Y	N/A	13,444	N	359, 360
5	Wiscasset	ISTR-188-07	Trib. to Back River/ Monstweag Bay	2	INT	Y	N/A	14,547	N	359
5	Windsor	PSTR-162-02	Trib. to West Branch Sheepscot River	2	PER	Y	Y	291	N	417
5	Windsor	PSTR-162-06	Trib. to West Branch of Sheepscot River	1.5	PER	Y	Y	1,595	N	
5	Wiscasset	ISTR-186-05	Trib. to Montsweag Brook	1.5	INT	Y	N/A	2,386	N	364, 365
5	Wiscasset	ISTR-186-07	Trib. to Montsweag Brook	3	INT	Y	N/A	2,193	N	365
5	Wiscasset	ISTR-188-01	Trib. to Back River/ Montsweag Bay	3	INT	Y	N/A	15,388	N	359
5	Wiscasset	ISTR-188-08	Trib. to Back River/ Monstweag Bay	3	INT	Y	N/A	12,829	N	360
5	Wiscasset	ISTR-186-01	Trib. to Chewonki Creek	4	INT	Y	N/A	5,614	N	363

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/ INT) ³	Atlantic Salmon Habitat (Y/N) ⁶	Brook Trout ⁷ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing ⁹ (Y/N)	Natural Resource Map/Sheet Number
5	Wiscasset	PSTR-188-04	Trib. to Back River/ Monstswag Bay	1	PER	Y	N/A	12,450	Y	360
5	Wiscasset	ISTR-187-04	Trib. to Chewonki Creek	5	INT	Y	N/A	6,112	N	363
5	Windsor	PSTR-162-01	Trib. to West Branch Sheepscot River	8	PER	Y	Y	265	N	417
5	Windsor	PSTR-162-09	Trib. to West Branch Sheepscot River	3	PER	Y	Y	158	N	416, 417
5	Windsor	PSTR-162-13	Trib. to West Branch Sheepscot River	1.5	PER	Y	Y	778	N	417
5	Windsor	ISTR-162-07	Trib. to West Branch Sheepscot River	8	INT	Y	N/A	268	N	417
5	Windsor	ISTR-162-14	Trib. to West Branch Sheepscot River	8	INT	Y	N/A	53	N	416
5	Windsor	PSTR-163-01	Trib. to West Branch Sheepscot River	40	PER	Y	Y	319	N	415
5	Woolwich	PSTR-185-01	Trib. to Montswag Brook	9.5	PER	Y	N/A	559	N	365
5	Wiscasset/Woolwich	PSTR-186-08	Montswag Brook	17.5	PER	Y	N/A	1,219	N	365

Segment	Town	Feature ID	Stream Name ¹	Ave. Stream Width (ft) ²	Stream Type (PER/INT) ³	Atlantic Salmon Habitat (Y/N) ⁴	Brook Trout ⁵ (Y/N)	Nearest New Structure Location (ft)	Temp. Equip. Crossing (Y/N)	Natural Resource Map/Sheet Number
5	Windsor	PSTR-162-12	Trib. to West Branch Sheepscot River	40	PER	Y	Y	362	N	416
5	Windsor	PSTR-163-02	West Branch Sheepscot River	40	PER	Y	Y	51	N	414, 415, 416

Notes:

- ¹ Stream name is based on USGS National Hydrography dataset.
Tributary names are based on a review by the applicant of the watershed areas and drainage patterns.
- ² Stream widths are based on field data collected by the applicant
- ³ Stream type is based on field work by the applicant.
- ⁴ Atlantic Salmon habitat is based on Maine Office of GIS data catalog. Edition 2016-03-21.
- ⁵ Brook trout habitat is based on information submitted by MDIFW on January 24, 2019

Appendix F Compensation Requirements

Table F-1: Summary of Compensation as Required by NRPA and/or USACE

Resource Type & Impact	Agency Requiring	Form of Compensation	Type and Amount of Compensation
47.638 acres of Temporary Wetland Fill	USACE	Preservation & In-Lieu Fee	Preservation of 56.97 acres of wetlands. \$154,369.29
105.252 acres of Permanent Cover Type Conversion of Forested Wetlands ¹	USACE & MDEP	Preservation	Preservation of three parcels, (Little Jimmie Pond, Flagstaff Lake, and Pooler Pond tracts) 440.29 acres of wetlands.
3.814 acres of Permanent Fill in Wetlands of Special Significance (WOSS) ²			
0.307 acres of Permanent Fill in Wetland (Non-WOSS)			
0.743 acres of Permanent Wetland Fill in SVP Habitat	MDEP	In-Lieu Fee	\$623,657.53
3.678 acres of Permanent Forested Wetland Conversion in SVP Habitat			
0.719 acres of Permanent Upland Fill in SVP Habitat			
27.572 acres of Permanent Upland Conversion in SVP Habitat			
Direct and Indirect Impact to USACE Jurisdictional Vernal Pools	USACE	In-Lieu Fee	\$2,015,269.01
0.003 acres of Permanent Wetland Fill in IWWH	MDEP	In-Lieu Fee	\$253,352.53
2.622 acres of Permanent Forested Wetland Conversion in IWWH			
0.014 acres of Permanent Upland Fill in IWWH			
12.387 acres of Permanent Upland Conversion in IWWH			
	In-Lieu Fee		\$3,046,648.37
	Land Preservation		1022.4 acres of preservation containing 510.75 acres of wetland.

¹The USACE requires compensation for Permanent Cover Type Conversion of Forested Wetlands. The MDEP requires compensation for Permanent Cover Type Conversion of significant wildlife habitat. Compensation for wetlands within significant wildlife habitat, IWWH and SVPH, are not included within the Permanent Cover Type Conversion of Forested Wetlands calculation and are calculated separately within their respective categories. Cover type conversion within upland areas of IWWH and SVPH are compensated separately as well.

²Permanent fill in WOSS excludes fill in IWWH and SVPH, which are calculated separately, in their respective categories.

Table F-2: Summary of Compensation Resulting from Consultation with Resource Agencies

Resource Type & Impact	Agency Requiring	Form of Compensation	Amount of Compensation
9.229 acres of forested conversion in Unique Natural Communities	MNAP	Fee contribution to Maine Natural Areas Conservation Fund	\$1,224,526.82
Forested conversion to the Goldie's Wood Fern	MNAP	Funding for rare plant surveys to the Maine Natural Areas Conservation Fund	\$10,000
26.416 acres of forest conversion in Roaring Brook Mayfly and Northern Spring Salamander Conservation Management Areas	MDIFW	Fee contribution to Maine Endangered and Nongame Wildlife Fund	\$469,771.95
39.209 acres of forest conversion in the Upper Kennebec Deer Wintering Area	MDIFW	Preservation	Seven parcels, totaling 717 acres of land in the Upper Kennebec DWA
Habitat and fisheries impacts, including 11.02 linear miles of forested conversion in riparian buffers	MDEP & MDIFW	Preservation	Three preservation parcels (Basin, Lower Enchanted, and Grand Falls tracts), totaling 1053.5 acres, containing 12.02 linear miles of stream
		Fee contribution to Maine Endangered and Nongame Wildlife Fund	\$180,000
Impacts to Brook Trout and Coldwater Fisheries	MDEP	Funding for culvert replacements	\$1,875,000
Impact to Outstanding River Segments	MDEP	Preservation	Three preservation parcels, (Basin, Lower Enchanted, and Grand Falls tracts) offering 7.9 miles of frontage on the Dead River, an Outstanding River Segment
Habitat fragmentation and impact to wildlife movement	MDEP	Conservation	Conservation of 40,000 acres in the vicinity of Segment 1
Total Additional Monetary Contribution			\$3,759,298.76
Total Additional Land Preservation/Conservation			41,770.5 Acres

Appendix G
Table of Areas Requiring Additional Erosion Control Measures

Transmission Line Spans				
Pole #			Pole #	
From	To		From	To
3006-541	3006-542		3006-633	3006-648
3006-547	3006-549		3006-659	3006-664
3006-549	3006-555		3006-674	3006-678
3006-556	3006-559		3006-684	3006-685
3006-563	3006-564		3006-697	3006-699
3006-570	3006-572		3006-705	3006-706
3006-576	3006-577		3006-706	3006-727
3006-579	3006-580		3006-728	3006-747
3006-582	3006-589		3006-748	3006-758
3006-594	3006-599		3006-760	3006-764
3006-603	3006-604		3006-765	3006-769
3006-606	3006-608		3006-771	3006-788
3006-609	3006-613		3006-793	3006-794
3006-616	3006-622		3006-796	3006-797
3006-624	3006-626		3006-799	3006-817

4748
L-27625-26-A-N/ L-27625-TG-B-N/ L-27625-2C-C-N
L-27625-VP-D-N/ L-27625-IW-E-N

H-1

Appendix H
Land Use Planning Commission
Site Law Certification



JANET T. MILLS
GOVERNOR

4749
STATE OF MAINE
DEPARTMENT OF AGRICULTURE, CONSERVATION & FORESTRY
LAND USE PLANNING COMMISSION
22 STATE HOUSE STATION
AUGUSTA, MAINE 04333-0022

AMANDA E. BEAL
COMMISSIONER
JUDY C. EAST
EXECUTIVE DIRECTOR

**SITE LAW
CERTIFICATION**

COMMISSION DETERMINATION
IN THE MATTER OF

REQUEST OF MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION
FOR SITE LOCATION OF DEVELOPMENT LAW CERTIFICATION
CENTRAL MAINE POWER COMPANY
NEW ENGLAND CLEAN ENERGY CONNECT
SITE LAW CERTIFICATION SLC-9

FINDINGS OF FACT AND DETERMINATION

The Maine Land Use Planning Commission (“Commission”), at a meeting of the Commission held on January 8, 2020, and after reviewing the request of the Maine Department of Environmental Protection (“Department”) for Site Location of Development Law (“Site Law”) Certification (“SLC”) SLC-9, supporting documents and other related materials on file, makes the following findings of fact and determination.

PROJECT DESCRIPTION AND LOCATION

Central Maine Power Company (“CMP”) proposes to construct the New England Clean Energy Connect Project (“proposed Project”), a high voltage direct current (“HVDC”) transmission line and related facilities to deliver electricity from Quebec, Canada to a new converter station in Lewiston, Maine. The proposed Project would include three main components: construction of a new transmission line corridor, expansion of an existing transmission line corridor, reconstruction of existing transmission lines within existing corridors, and rebuilding and upgrading substations.

The areas that would be involved in the proposed Project extend from Beattie Township at the Maine border with Quebec, Canada to Lewiston, Maine. The transmission line corridor and other components associated with the proposed Project would be located in the following townships, plantations, towns and municipalities:

- Franklin County townships: Beattie Township, Merrill Strip Township, Skinner Township;



- Somerset County townships and plantations: Appleton Township, Bald Mountain Township, Bradstreet Township, Concord Township, Hobbstown Township, Johnson Mountain Township, Moxie Gore, Parlin Pond Township, The Forks Plantation, T5 R7 BKP WKR, West Forks Plantation; and
- Towns and municipalities: Alna, Anson, Auburn, Caratunk, Chesterville, Cumberland, Durham, Embden, Farmington, Greene, Industry, Jay, Leeds, Lewiston, Livermore Falls, Moscow, New Sharon, Pownal, Starks, Whitefield, Wilton, Windsor, Wiscasset, Woolwich.

The proposed Project is described by CMP in five segments. A project scope map showing the extent of each segment is included as **Appendix A** of this Site Law Certification.¹ Segment 1 would be approximately 53.5 miles in length and would begin in Beattie Township and end in Moxie Gore, entirely within townships and plantations served by the Commission. Segment 2 would be approximately 21.9 miles in length and would begin in The Forks Plantation and end in Moscow, within which The Forks Plantation and Bald Mountain Township are served by the Commission. Segment 3 would be approximately 71.5 miles in length and would begin in Concord Township and end in Lewiston, within which only Concord Township is served by the Commission. Segments 4 and 5 would be wholly within towns and municipalities not served by the Commission.

A new approximately 145.3-mile, 320-kilovolt HVDC transmission line would be constructed in Segments 1, 2, and 3. In Segment 1, the transmission line corridor would be 300 feet wide, is generally forested, and is not currently developed. A 150-foot wide portion of the Segment 1 corridor would be cleared of vegetation capable of growing into the conductor safety zone, as required by the National Electric Reliability Corporation.² In Segments 2 and 3, the proposed Project would be co-located with an existing transmission line and clearing of the corridor would be increased by 75 feet to accommodate the new line.

No new permanent roads would be constructed for portions of the proposed Project within the Commission's jurisdiction. Access to portions of the proposed Project within the Commission's jurisdiction in Segments 1, 2, and 3 would be over existing land management roads.³

CMP would utilize a backhoe to excavate holes to install transmission line structures. Placement of transmission line structures would disturb areas ranging from 30 square feet to 195 square feet, depending on the height of the transmission line structure required at a specific location and the size of the base needed to install each transmission line structure. Additional holes would be excavated to install guy wire anchors, as needed. Blasting may be required in some areas to achieve the

¹ Excerpts from CMP's Site Law application, exhibit 1-1, and September 18, 2019, Site Law application amendment.

² The North American Electric Reliability Corporation is a not-for-profit international regulatory authority whose mission is to assure the effective and efficient reduction of risks to the reliability and security of the grid. The North American Electric Reliability Corporation develops and enforces reliability standards, including the management of vegetation to prevent encroachments into the Minimum Vegetation Clearance Distance of its transmission lines.

³ Access to Segments 1, 2, and 3 would be largely over privately-owned roads used for timber harvesting activities. Land management roads are used primarily for agricultural or forest management activities; however, some private landowners in the remote areas of Maine where the proposed Project would be located allow members of the public to utilize land management roads for recreation, hunting, fishing and other similar uses.

necessary depth for the transmission line structures and guy wire anchor bases. Once a hole is dug to the proper depth, a crane would be used to place the pole in proper alignment.⁴

SCOPE OF COMMISSION’S REVIEW: ZONING, LAND USE STANDARDS, AND COMPREHENSIVE LAND USE PLAN

Pursuant to 12 M.R.S. § 685-B(1-A)(B-1), the Commission must determine whether the proposed Project is an allowed use within the subdistricts in which it is proposed and whether the proposed Project meets any land use standards established by the Commission that are not considered in the Department’s review under the Site Law.

a. Commission’s Zoning Subdistricts & Use Listings

Within the Commission’s jurisdictional area, there are three major zoning district classifications—management, protection, and development districts—which the Commission has further delineated into zoning subdistricts to protect important resources and prevent conflicts between incompatible uses. For each subdistrict, the Commission designated uses that are allowed without a permit, uses that are allowed without a permit subject to standards, uses that are allowed with a permit, uses that are allowed with a permit by special exception, and uses that are prohibited. The Commission’s zoning subdistricts are codified in the Commission’s Land Use Districts and Standards, 01-672 C.M.R. ch. 10 (“Chapter 10”).

The proposed Project would be located within the following subdistricts, listed in the Table 1 below. Because the proposed Project is a “utility facility” as that term is defined in Ch. 10, § 10.02(248), the table identifies the status of utility facilities within each listed subdistrict.

Table 1. Subdistricts in which the proposed Project is proposed and use listing status.

Subdistrict	Use Listing Status
General Development	Allowed with a permit
Residential Development	Allowed with a permit
General Management	Allowed with a permit
Flood Prone Protection	Allowed with a permit
Fish and Wildlife Protection	Allowed with a permit
Great Pond Protection	Allowed with a permit
Shoreland Protection	Allowed with a permit
Recreation Protection	Allowed with a permit by special exception
Wetland Protection	Allowed with a permit by special exception

⁴ Additional details regarding proposed construction plans are found in CMP’s Natural Resources Protection Act application, section 7.0. The proposed Project would include other components that are either exempt from Site Law review by the Department or that are otherwise not proposed within the Commission’s jurisdiction. Additional information regarding these components is provided in CMP’s Site Law permit application.

b. Land Use Standards

The Commission's land use standards are codified in Ch. 10, §§ 10.24 – 10.27, and are grouped into three categories: development standards, dimensional requirements, and activity-specific standards.⁵ The Commission's role in certifying the proposed Project to the Department is limited to reviewing development standards that are not duplicative of the Department's review pursuant to the Site Law. 12 M.R.S. § 685-B(1-A)(B-1). Applicable statutory criteria⁶ and review standards that are not duplicative of the Department's review are:

- a. Vehicular Circulation, Access and Parking – Ch. 10, §§ 10.24(B) and 10.25(D);
- b. Conformance with Chapter 10 and the regulations, standards and plans adopted pursuant to Ch. 10 – Ch. 10, § 10.24(E);
- c. Subdivision and Lot Creation – Ch. 10, §§ 10.24(F) and 10.25(Q);
- d. Public's Health, Safety and General Welfare – Ch. 10, § 10.24
- e. Lighting – Ch. 10, § 10.25(F);
- f. Activities in Flood Prone Areas – Ch. 10, § 10.25(T);
- g. Dimensional Standards – Ch. 10, § 10.26(D) and (F);
- h. Vegetative Clearing – Ch. 10, § 10.27(B);
- i. Pesticide Application – Ch. 10, § 10.27(I); and
- j. Signs – Ch. 10, § 10.27(J).

c. Comprehensive Land Use Plan

Pursuant to 12 M.R.S. § 685-C(1), the Commission has a Comprehensive Land Use Plan that guides the Commission in developing specific land use standards, delineating district boundaries, siting development, and generally fulfilling the purposes of the Commission's governing statute. If approving applications submitted to it pursuant to 12 M.R.S. § 685-A(10) and § 685-B, the Commission may impose such reasonable terms and conditions as the Commission considers appropriate to satisfy the criteria of approval and purpose set forth in these statutes, rules, and the Comprehensive Land Use Plan.⁷

⁵ Ch. 10, subchapter III.

⁶ The criteria for approval set forth at 12 M.R.S. § 685-B(4) are restated in Chapter 10, § 10.24.

⁷ Ch. 10, § 10.24.

PROCEDURAL BACKGROUND

On March 31, 2017, Massachusetts Electric Distribution Companies, in coordination with the Massachusetts Department of Energy Resources, issued a Request for Proposal for Long-Term Contracts for Clean Energy Projects (“Massachusetts RFP”).

On July 27, 2017, CMP and Hydro Renewable Energy, Inc., an affiliate of Hydro Quebec, submitted to Massachusetts Electric Distribution Companies a joint bid proposal, *New England Clean Energy Connect: 100% Hydro*, in response to the Massachusetts RFP.

On September 27, 2017, CMP submitted to the Department an application for a Natural Resources Protection Act (“NRPA”) permit pursuant to 38 M.R.S. §§ 480-A – 480-JJ and a Site Law permit pursuant to 38 M.R.S. §§ 481 – 490 for its proposed Project.

On October 12, 2017, the Department submitted to the Commission a Request for Certification for CMP’s proposed Project.

On October 13, 2017, the Commission provided the Department with a Completeness Determination in which staff determined that there was sufficient information to begin the review of the certification request pursuant to 12 M.R.S. § 685-B(1-A)(B-1), and the Department accepted the applications as complete for processing.

On November 17, 2017, the Commissioner of the Department decided that the Department would hold a public hearing on CMP’s NRPA and Site Law permit applications. On June 27, 2018, the Department provided notice of the opportunity to intervene in its hearing.

On December 11, 2017, the Appalachian Mountain Club, Maine Audubon, and the Natural Resources Council of Maine, in a joint letter to the Commission, filed a request for a hearing on the allowed use determination portion of the Commission’s certification of the proposed Project.

On December 19, 2017, the Commission voted to hold a public hearing limited to whether the proposed Project is an allowed use within the Recreation Protection (“P-RR”) subdistricts. On March 28, 2018, Massachusetts Electric Distribution Companies selected the proposed Project as the winning bid in the Massachusetts RFP.

On July 12, 2018, the Commission provided notice of the public hearing and opportunity to intervene.

To facilitate efficient review and avoid the need for duplicative testimony by the same parties and interested members of the public in different proceedings, the Commission decided to hold its public hearing jointly with the Department.

Through its First Procedural Order, the Commission granted intervenor status to the 30 petitioners identified in Table 2 below. Additionally, the Commission allowed the Office of the Public Advocate to participate as a governmental agency, which, pursuant to Chapter 5 § 5.15, has all the rights of an intervenor.

Table 2. Persons and entities granted leave to intervene.

Hawk’s Nest Lodge	Taylor Walker
Kennebec River Angler	Tony DiBlasi
Kingfisher River Guides	Edwin Buzzell
Maine Guide Service, LLC	Appalachian Mountain Club
Mike Pilsbury	Natural Resources Council of Maine
Alison Quick	Trout Unlimited
Carrie Carpenter	City of Lewiston
Courtney Fraley	Town of Caratunk
Eric Sherman	Wagner Forest Management
Kathy Barkley	NextEra Energy Resources, LLC
Kim Lyman	Western Mountains & Rivers Corp.
Linda Lee	International Brotherhood of Electrical Workers
Mandy Farrar	Industrial Energy Consumer Group
Matt Wagner	Lewiston Auburn Metropolitan Chamber of Commerce
Noah Hale	Maine State Chamber of Commerce

The Presiding Officer consolidated the following twelve intervenors: 1) Alison Quick, 2) Carrie Carpenter, 3) Courtney Fraley, 4) Eric Sherman, 5) Kathy Barkley, 6) Kim Lyman, 7) Linda Lee, 8) Mandy Farrar, 9) Matt Wagner, 10) Noah Hale, 11) Taylor Walker, and 12) Tony DiBlasi. This group is referred to as the “Local Residents and Recreational Users” in Intervenor Group 10 (see next paragraph).

The Department’s and the Commission’s Presiding Officers further consolidated the Intervenor groups into the following ten (10) intervenor groups.

- Group 1: Friends of Boundary Mountains*; Maine Wilderness Guides*; Old Canada Road*
- Group 2: West Forks Plantation*; Town of Caratunk**; Kennebec River Anglers**; Maine Guide Services**; Hawk’s Nest Lodge**; Mike Pilsbury**
- Group 3: International Energy Consumer Group**; City of Lewiston**; International Brotherhood of Electrical Workers**; Maine Chamber of Commerce**;
Lewiston/Auburn Chamber of Commerce***

-
- Group 4: Natural Resources Council of Maine^{**}; Appalachian Mountain Club^{**}; Trout Unlimited^{**}
- Group 5: Brookfield Energy^{*}; Wagner Forest^{**}
- Group 6: The Nature Conservancy^{*}; Conservation Law Foundation^{*}
- Group 7: Western Mountains and Rivers Corporation^{**}
- Group 8: NextEra^{**}
- Group 9: Office of the Public Advocate^{*}
- Group 10: Edwin Buzzell^{**}; Local Residents and Recreational Users^{***}

Note:

- * indicates: Intervenors with the Department only
- ** indicates: Intervenors with the Department and the Commission
- *** indicates: Intervenors with the Commission only

After receiving input from the parties, the Department's and the Commission's Presiding Officers selected the following hearing topics:

- a. Scenic Character and Existing Uses;
- b. Wildlife Habitat and Fisheries;
- c. Alternatives Analysis; and
- d. Compensation and Mitigation.

The Commission required prefiling of all direct and rebuttal testimony in advance of the hearing. On April 1-5, 2019, in Farmington, and on May 9, 2019, in Bangor, the Department held a public hearing on CMP's proposed Project. On April 2, 2019, and May 9, 2019, only, the hearing was held jointly with the Commission. The hearing included both daytime and evening sessions. Participation in the daytime sessions was limited to the parties. The evening sessions, held on April 2, 2019, for the Commission and the Department jointly, and April 4, 2019, for the Department only, were devoted to receiving testimony from members of the public. The Commission allowed the submission of post-hearing briefs, proposed findings of fact, and reply briefs following the hearing. The Commission and the Department concluded the hearing in this matter on May 9, 2019. The record remained open until May 31, 2019, for the parties to submit limited additional evidence and responses. The Commission's hearing record closed on May 31, 2019.

The opportunity for public comment on the proposed Project began with receipt of the request for certification on October 12, 2017. In October 2017, the Commission created a webpage for the proposed Project on which pertinent information regarding the Commission's certification process was posted.⁸ A GovDelivery distribution list specific to the proposed Project was created by the Commission in October 2017 to provide updates on the proposed Project.⁹ Any interested person was provided the option to enter their email address to receive updates regarding the proposed Project. The Commission received approximately 300 written comments from members of the public, municipalities, plantations, and townships regarding the proposed Project. Additionally, the Commission received written and oral testimony from dozens of members of the public at the public hearing on April 2, 2019. Following the conclusion of the hearing, the Presiding Officers held open the opportunity for public comment until May 20, 2019, then until May 28, 2019, to allow the public to file statements in rebuttal of those written statements filed by May 20, as required by Commission rule Chapter 5.

On September 11, 2019, the Commission conducted a deliberative session to consider a draft Site Law Certification decision document. The Commission did not vote or make any decisions regarding the draft decision document at the September meeting.

On September 18, 2019, CMP submitted to the Department and the Commission a petition to reopen the record with attachments that describe an amendment to the Site Law and NRPA applications pertaining to the originally proposed route in the area near Beattie Pond. On October 3, 2019, the Presiding Officers of the Department and the Commission reopened the record for the purpose of allowing CMP to amend its Site Law and NRPA applications and to gather additional evidence needed to evaluate the proposed alternative route outside of the P-RR subdistrict at Beattie Pond. Intervenor were permitted to submit evidence and comments pertaining to the amendment until November 12, 2019. CMP was permitted to submit evidence and comments responsive to the Intervenor's submissions until November 26, 2019. The general public was permitted to submit evidence and comments until November 26, 2019.

ALLOWED USE DETERMINATION: SPECIAL EXCEPTION REVIEW CRITERIA

As set forth in Table 1 above, a utility facility is a use allowed with a permit within all subdistricts in which it is proposed, except in the P-RR and Wetland Protection ("P-WL") subdistricts. Within the P-RR and P-WL subdistricts, a utility facility is allowed with a permit by special exception. For the Commission to find that a use is allowed by special exception in both the P-RR and P-WL subdistricts, pursuant to Ch. 10, §§ 10.23(I)(3)(d) and 10.23(N)(3)(d) respectively, an applicant must show by substantial evidence that:

- a. there is no alternative site which is both suitable to the proposed use and reasonably available to the applicant;

⁸ https://www.maine.gov/dacf/lupc/projects/site_law_certification/slc9.html (last accessed December 30, 2019).

⁹ GovDelivery is a Maine government subscription service allowing citizens to sign up for free text and email updates about topics relevant to the subscriber.

- b. the use can be buffered from those other uses and resources within the subdistrict with which it is incompatible; and
- c. such other conditions are met that the Commission may reasonably impose in accordance with the policies of the Comprehensive Land Use Plan.

The proposed Project would cross or traverse two separate P-RR subdistricts: 1) where the proposed Project would cross the Kennebec River in West Forks Plantation and Moxie Gore; and 2) at a proposed crossing of the Appalachian Trail in Bald Mountain Township. The proposed Project crosses P-WL subdistricts in numerous locations throughout Segments 1, 2, and 3.¹⁰

The purpose of the P-RR subdistrict is to provide protection from development and intensive recreational uses to those areas that currently support, or have opportunities for, unusually significant primitive recreation activities. By so doing, the natural environment that is essential to the primitive recreational experience will be conserved. Ch. 10, § 10.23(I). The purpose of the P-WL subdistrict is to conserve coastal and freshwater wetlands in essentially their natural state because of the indispensable biologic, hydrologic and environmental functions which they perform. Ch. 10, § 10.23(N).

SPECIAL EXCEPTION ALTERNATIVES ANALYSIS

The Commission considers alternatives analysis information to determine whether a proposed activity is an allowed use by special exception within P-RR and P-WL subdistricts.¹¹ Although the Commission's role does not include evaluation of alternatives outside the P-RR and P-WL subdistricts, an understanding of CMP's overall alternatives analyses for siting the proposed Project is necessary context for the Commission's evaluation of the P-RR and P-WL special exception criteria.¹²

¹⁰ CMP's initial proposal was to cross or traverse three separate P-RR subdistricts: 1) where the proposed Project would cross the Kennebec River; 2) adjacent to Beattie Pond in Beattie Township, Lowelltown Township, Skinner Township, and Merrill Strip Township; and 3) at a proposed crossing of the Appalachian Trail. CMP's September 2019 application amendment revised the route of the proposed Project to avoid the P-RR subdistrict at Beattie Pond. As a result, no portion of the revised proposed Project route is within the Beattie Pond P-RR subdistrict or within Lowelltown Township.

¹¹ The Department requires a broader alternatives analysis as part of its review under the NRPA that addresses avoidance and minimization of impacts to protected natural resources over the entire proposed Project, including impacts to protected natural resources within the Commission's jurisdiction.

¹² CMP's complete alternatives analysis is provided in section 2.0 of its NRPA permit application with the Department. Alternatives analyses pertaining to the P-RR and P-WL subdistricts are discussed in section 25 of CMP's Site Law permit application as well as in its hearing testimony before the Commission.

a. Alternative Routes for Transmission Line Corridor: Above Ground Alternatives

CMP analyzed three HVDC transmission line alternative routes when designing the proposed Project, each of which it stated would meet the project purpose of delivering energy generation from Québec to the New England Control Area.¹³ In doing so, CMP specifically evaluated alternatives that would avoid the P-RR subdistricts. The three routes CMP evaluated are the Preferred Route, which is the route selected by CMP for its proposed Project for which it seeks permits; Alternative 1; and Alternative 2. Alternative 1 would require a new and additional crossing of the Appalachian Trail, would require acquisition of lands held in conservation, would include 93 miles of new corridor as compared to the Preferred Route distance of 53.5 miles, and would require more landowner acquisitions. Alternative 2 would also require a new crossing of the Appalachian Trail, the acquisitions of land in the 36,000-acre Bigelow Preserve and from the Penobscot Indian Nation, contains more wetland and stream crossings than the Preferred Alternative, and requires more landowner acquisitions than the Preferred Alternative.

CMP considered the following in conducting its evaluation of alternatives: conserved lands, undeveloped right-of-way, amount of clearing required, number of stream crossings, transmission line length, National Wetlands Inventory mapped wetlands, deer wintering areas, inland waterfowl and wading bird habitat, public water supplies, significant sand and gravel aquifers, and parcel count total. In siting Segment 1, CMP stated that it considered the presence of publicly owned conservation lands (e.g., the Appalachian National Scenic Trail and Maine Bureau of Parks and Lands properties), as well as those held by private conservation organizations such as The Nature Conservancy and the New England Forestry Foundation. The paramount goal of the route selection was to avoid iconic scenic and recreational areas that characterize this part of western Maine, including the Bigelow Preserve, the Crocker Mountain High Peaks area, Mount Abraham, Saddleback Mountain, the Moosehead Region Conservation Easement, Grace Pond in Upper Enchanted Township, the Leuthold Forest Preserve, the Number 5 Bog Ecological Reserve, and the Moose River/Attean and Holeb Ponds. CMP further stated that care was taken to microsite the new corridor in a manner that would avoid visual impacts to smaller but visually sensitive areas such as the Moxie Falls Scenic Area and the Cold Stream Forest.

CMP stated that it would utilize existing transmission line corridors to the greatest extent practicable for the proposed Project. Approximately 73 percent of the proposed Project would be sited in existing transmission corridors, and CMP already holds title, right, or interest to lands within these existing corridors. Regarding Segment 1, the undeveloped corridor between the Canadian border and The Forks Plantation, CMP asserts that has fee title, leases, and easements to all the land within the Preferred Alternative corridor.

Ultimately, CMP decided that the Preferred Alternative would be the least environmentally damaging and most cost-effective option and is the route selected for the proposed Project.

¹³ CMP witness Brian Berube, hearing transcript, April 2, 2019, pages 129-130; NRPA application, section 2.0.

CMP evaluated additional specific alternatives to avoid crossing the P-RR subdistricts at the Kennebec River, Beattie Pond, and the Appalachian Trail.

In an effort to avoid the P-RR subdistrict at Beattie Pond, CMP negotiated an agreement with a landowner for a corridor south of the pond through Merrill Strip Township.¹⁴

CMP provided an easement to the United States government for the construction of the Appalachian Trail at the location where it now seeks to install an additional transmission line as part of the proposed Project.¹⁵ The easement reserves the right to build and maintain additional transmission lines and clear within the corridor. CMP contends that alternative alignments at this location would result in one or more new crossings of the Appalachian Trail where there is not an existing transmission line.

None of the components of the proposed underground crossing of the Kennebec River would be visible from the P-RR subdistrict. CMP concluded that the previously proposed overhead crossing of the Kennebec River is no longer suitable as it would have a greater environmental impact than the current proposal.

More detailed discussion of alternatives for sections of the proposed Project that would cross or traverse the P-RR subdistricts is provided below.

b. Alternative Routes for Transmission Line Corridor: Undergrounding Alternative

Several intervenors raised the concern that CMP did not include undergrounding the transmission line as an alternative considered to the proposed overhead crossing of the Appalachian Trail P-RR subdistrict. In response, CMP argued that it “is under no obligation to analyze alternatives that are too remote, speculative, or impractical to pass the threshold test of reasonableness.... It was and remains so obvious that undergrounding would not be practicable that CMP did not initially include it as an alternative in its Applications.”¹⁶ CMP testified that when the proposed Project was designed and put to bid for the Massachusetts RFP, incorporating the costs associated with undergrounding would have resulted in CMP’s proposal not being competitive relative to the other proposals and therefore not selected by the Massachusetts Electric Distribution Companies.¹⁷ Additional costs to underground the proposed Project at the Appalachian Trail P-RR subdistrict would be borne by CMP (or an affiliate owner of the [proposed] Project) and its investors.¹⁸

¹⁴ Prior to submitting its September 2019 application amendment, CMP testified that the landowner demanded approximately 50 times the fair market value for the land necessary to avoid the Beattie Pond P-RR. Consequently, CMP concluded that this alternative was not reasonably available. (CMP witness Brian Berube, hearing transcript, April 2, 2019, page 130.)

¹⁵ CMP rebuttal testimony, exhibit 9-B.

¹⁶ CMP post-hearing reply brief, page 20.

¹⁷ CMP witness Thorn Dickinson, prefiled rebuttal testimony.

¹⁸ CMP witness Thorn Dickinson, prefiled rebuttal testimony, page 11.

Despite CMP's conclusion that undergrounding would be obviously cost prohibitive without conducting a thorough analysis, CMP provided an underground alternatives analysis in response to the testimony of witnesses in Intervenor Groups 2, 6, and 8. CMP additionally provided detailed cost analysis information to the Commission and Department on May 17, 2019. CMP argued that "this analysis confirmed CMP's initial determination that undergrounding the [proposed] Project, or even portions of the [proposed] Project beyond the proposed undergrounding at the upper Kennebec River, is not reasonable, and therefore also could not be 'practicable,' because the costs of doing so would defeat the purpose of the [proposed] Project. For the same reason, undergrounding in the two other P-RR subdistricts that the [proposed] Project will cross is not suitable or reasonably available to CMP."^{19,20}

Intervenor Groups 2, 4, and 10 argued that CMP did not conduct a proper and thorough alternatives analysis, in part, because the time to conduct such analysis was at the time the proposed Project was being sited, not during the hearing. Intervenor Group 4 argued that the amount of redacted information in CMP's undergrounding cost analysis renders the analysis of limited use in evaluating whether or not these figures are reasonable, what they include, and whether the alternatives could have been practicable, had they ever truly been considered by CMP.²¹

Intervenor Group 8 argued that HVDC transmission lines installed worldwide that are similar to the one proposed by CMP are routed underground and therefore are technically feasible. Undergrounding some or all of the proposed Project in Segment 1, Intervenor Group 8 argues, is a financially viable alternative that would mitigate scenic and recreational concerns in this section of the proposed Project. CMP committed to route the proposed Project under the Kennebec River, which will cost \$42 million, approximately four percent of the project's capital cost.

Intervenor Group 8 argued the incremental cost increases for undergrounding the specific areas within the P-RR subdistrict for Segment 1 range from \$13, 28, and 30 million, which is approximately one, three, and three percent increases in the capital costs for the proposed Project. The total associated cost attributable to routing under the Kennebec River and specific areas in Segment 1, therefore, sum to only 11 percent of the proposed Project's total costs. Intervenor Group 8 argued that CMP conceded that its budget includes a contingency of 15 percent of the total project cost. Accordingly, undergrounding specific areas within the P-RR subdistrict for Segment 1 is well within CMP's anticipated contingency funds for the NECEC.²²

CMP argued that, contrary to the assertions of Intervenor Group 8, undergrounding is not available or feasible considering the technology and logistics and doing so would defeat the purpose of the proposed Project because it would not have been selected by the Massachusetts Electric Distribution

¹⁹ CMP post-hearing reply brief, pages 20-21.

²⁰ CMP considered undergrounding alternatives for all three P-RR subdistricts proposed in its initial application. However, the September 2019 application amendment eliminated all portions of the proposed Project from the Beattie Pond P-RR subdistrict. This change in the proposed Project is not reflected in testimony and other record evidence from the hearing that is cited in this order.

²¹ Intervenor Group 4 post-hearing brief.

²² Intervenor Group 8 post-hearing brief, page 4 (footnotes omitted).

Companies.²³ CMP argued that “[t]he design of transmission lines that interconnect systems is very, very site dependent” and that “underground transmission installations cause a continuous surface disruption (rather than intermittent and widely spaced at each overhead structure installation location), require additional control measures for soil erosion, sedimentation, and dust generation during construction, require permanent access roads to every jointing location along the route, and can only avoid wetlands and waterways by using higher cost and higher risk trenchless methods.”²⁴

In both prefiled rebuttal testimony and at the live hearing, CMP’s witness, Justin Bardwell provided testimony regarding underground transmission methods, potential alternate routes, estimated costs, anticipated environmental and public impacts, and additional risk during construction. Mr. Bardwell identified and discussed direct burial and trenchless installation technologies used as alternatives to overhead transmission lines. Key points relative to the Commission’s review include the following.

- Generally, direct burial of a transmission line in a trench is the lowest cost underground option. This requires digging a trench, management of spoils, erosion control, and removal of trees along a 75-foot wide corridor.
- Direct burial is often unsuitable for installation within roadways.
- Trenchless horizontal directional drill (“HDD”) technology methodology can be used to overcome or avoid surface obstacles, such as highways, railroads, sensitive wetlands, or waterways.
- HDD installation is two to ten times more expensive than trenched installations.
- HDD requires termination stations, similar in appearance to a substation, when transitioning between overhead and underground segments.
- Underground construction for the proposed Project would be expected to be mostly direct burial with HDD installations used for major highway, waterway, and wetlands crossings.
- The cost estimate for undergrounding the entirety of the proposed route in the proposed Project would be approximately \$1.9 billion. The cost estimate for undergrounding only Segment 1 would be approximately \$750 million. These costs are approximately 5 to 7 times more than the expected cost of overhead transmission construction.
- The vast majority of environmental impacts would be temporary impacts associated with construction.
- Outage rates for overhead and underground installations are respectively 0.53 incidents per 100 miles and 0.141 incidents per 100 miles. Outages in an overhead line are often restored

²³ CMP witness Thorn Dickinson, prefiled rebuttal testimony, pages 2-3, 10.

²⁴ CMP post-hearing reply brief, page 21.

in a few hours, while outages in underground cables typically require 2 to 5 weeks to restore.

- Larger vehicles are needed to service an underground transmission line than an overhead transmission line making access during winter and spring more challenging.

c. Kennebec River P-RR subdistrict alternatives analysis

The proposed Project includes the proposed crossing of the Kennebec River at a location north of Moxie Stream, between West Forks Plantation and Moxie Gore. This river segment is commonly referred to as the Kennebec Gorge and is located just below the Harris Station Dam, the largest hydropower generating facility in Maine. The P-RR subdistrict extends 250 feet from the normal high water mark on both sides of the Kennebec River from the outlet of Indian Pond at the Harris Station Dam to 0.5 miles above its confluence with the Dead River in The Forks Plantation.²⁵

Recreational whitewater rafting in Maine is centered on the Kennebec River, particularly within the Kennebec Gorge, the Dead River, and the West Branch of the Penobscot River.²⁶ Controlled flow releases from the Harris Station Dam support commercial and recreational rafting in this reach of the Kennebec. Between the dam and its confluence with the Dead River, there are no known residential or commercial developments within the Kennebec River P-RR subdistrict. Several individuals and companies representing the recreational and commercial uses of the Kennebec Gorge for whitewater rafting intervened in and testified at the hearing held by the Commission in April and May 2019.

In addition to the broader alternatives analyses discussed above, CMP evaluated three alternatives specific to the proposed crossing of the Kennebec River: 1) at a location north of Moxie Stream, between West Forks Plantation and Moxie Gore; 2) a crossing of the Kennebec River on CMP-owned land about one mile downstream of Harris Dam; and 3) a crossing of the Kennebec River near the Harris Station powerhouse. These are depicted in Figure 25-3 of CMP's Site Law application.

CMP selected the option north of Moxie Stream, between West Forks Plantation and Moxie Gore as its preferred alternative and, in its September 27, 2017, Site Law application, proposed to cross the Kennebec Gorge with an overhead transmission line. In response to early concerns about the impact of the overhead crossing proposal on scenic character and compatibility with the existing recreational uses, CMP, on October 19, 2018, filed an amendment to its Site Law and NRPA applications to incorporate an underground crossing of the Upper Kennebec River using HDD technology.

The proposed HDD crossing of the Kennebec River would not include the construction or placement of any structures within the P-RR subdistrict. The proposed HDD crossing would consist

²⁵ Comprehensive Land Use Plan, Appendix B, Rivers with Special Zoning (2010).

²⁶ Comprehensive Land Use Plan, page 102.

of three main components: 1) the HDD bore, a subgrade conduit containing the HDVC line; 2) two termination stations, one on each side of the river, where the transmission lines transition from underground to overhead; and 3) trenching, a direct buried conduit used to carry the transmission cables from the HDD bore to the termination station.

Intervenors provided no final arguments opposing CMP's proposed HDD crossing of the Kennebec River.

d. Commission findings and conclusions regarding the Kennebec P-RR subdistrict alternatives analysis

Given the potential for significant visual impacts to recreational users on the Kennebec River from an overhead alternative at that location, that the undergrounding alternative using a directional drill would result in no construction activity within the Kennebec River P-RR subdistrict, and the termination stations, which would also be located outside the Kennebec River P-RR, will be well buffered from the river, the Commission concludes that there is no other alternative that is both suitable and reasonably available to the applicant outside of the Kennebec River P-RR subdistrict.

e. The Merrill Strip Alternative (M-GN subdistrict) to the original Beattie Pond Proposed Route (P-RR subdistrict)

In its initial application, CMP proposed a section of the new corridor within the Beattie Pond P-RR subdistrict encompassing portions of Beattie Pond Township, Lowelltown Township, and Skinner Township. Beattie Pond is a remote, undeveloped, management class 6 lake.²⁷ The management objective of management class 6 ponds is prohibiting development within 1/2 mile of these ponds to protect the primitive recreational experience and coldwater lake fisheries in remote settings.²⁸ In 1978, the Commission established a P-RR subdistrict within 1/2 mile of the normal high water mark of Beattie Pond.

As stated above, a utility facility in a P-RR subdistrict is allowed by special exception, which requires an alternatives analysis. In its initial application, CMP evaluated an alternative route south of the Beattie Pond P-RR, an alternative route north of the Beattie Pond P-RR, and undergrounding. Regarding the alternative route south of the Beattie Pond P-RR, CMP stated that it attempted to negotiate an alternative alignment south of the Beattie Pond P-RR subdistrict through Merrill Strip Township, but the landowner required compensation of approximately 50 times fair market value for that property. (Thus, CMP concluded that that alternative was not practicable.)

Following the Commission's September deliberations, CMP petitioned to reopen the record:

[I]n light of the questions and concerns expressed by [the Commission] during the hearing, CMP continued to pursue the Merrill Strip Alternative

²⁷ Commission's Wildlands Lake Assessment Findings, Ch. 10, Appendix C

²⁸ Comprehensive Land Use Plan, page 290.

and recently had the opportunity to re-engage in negotiations with the landowner. Good cause exists to reopen the record because on August 30, 2019 CMP was able to close on the purchase of an easement, reviving the Merrill Strip Alternative and enabling CMP to propose construction of the [proposed] Project entirely outside of the Beattie Pond P-RR subdistrict.²⁹

The Commission and the Department granted CMP's request to reopen the record and, in its September 2019 application amendment, CMP proposed to avoid the Beattie Pond P-RR subdistrict by routing the proposed Project through a new tract, the Merrill Strip Alternative. The Merrill Strip Alternative is a 150-foot wide proposed transmission line corridor that would extend for approximately one mile across the northeast corner of Merrill Strip between Skinner and Beattie Townships. The Merrill Strip Alternative is located within a General Management subdistrict, where a utility facility is allowed with a permit.

The 150-foot wide corridor would be cleared of capable woody vegetation and managed in a persistent early successional habitat (i.e., scrub-shrub), consistent with CMP's Vegetation Management Plans to accommodate construction and maintenance of the transmission line. The Merrill Strip Alternative would require six new structures, five of which will be direct-embed monopoles and one will be a direct-embed two pole structure. The structures would be self-weathering steel, consistent with the CMP's original proposal, ranging in heights from 96 feet to 118.5 feet above ground level.³⁰

Intervenor Groups 2 and 10 "agree that the new location avoids Beattie Pond and consequently eliminates the negative impacts on this particular special resource by removing a small segment of the route from this sub-district. However, the short time frame to study this new area and the inability to give this new route adequate peer review leaves open the question of whether there are other as yet unidentified, negative affects created in this newly impacted area. It is also important to note that simply shifting 1 mile of the 53 miles through Maine's north western woods does not suddenly make the entirety of the 145 mile corridor acceptable nor mean that CMP has met its burden of proof under either the Department's or the Commission's legal standards."³¹

Intervenor Group 4 stated that CMP "did not conduct an adequate alternatives analysis" and that "[i]t did not fully analyze all of the alternative routes and it too quickly dismissed alternatives that the company deemed too expensive at the time. As a result, [CMP] failed to truly evaluate whether or not there were opportunities to avoid and minimize environmental impacts to achieve the least environmentally damaging practicable alternative."³²

Intervenor Group 3 stated that "[t]he [proposed Project] should be approved with or without the [Merrill Strip Alternative] because its benefits vastly outweigh its environmental costs, especially given proposed mitigation techniques. The [Merrill Strip Alternative], however, is on its face an

²⁹ Petition of Central Maine Power Company to Reopen the Record, page 2.

³⁰ Site Law amendment application, section 1.0.

³¹ Intervenor Groups 2 and 10's Response to CMP's Petition to Reopen the Record, page 3.

³² Intervenor Group 4's Comment on Supplemental Information on the Merrill Strip Alternative from Central Maine Power, pages 9-10.

environmentally superior alternative to [the proposed Project] crossing the Beattie Pond P-RR Subdistrict. The [Merrill Strip Alternative] is shorter by nearly 30 percent (1 mile versus 1.4 miles) and will use fewer structures, in an area almost exclusively used for private commercial timber harvesting. Therefore, [the Merrill Strip Alternative] will create fewer and less significant construction, maintenance, and environmental impacts.”³³

Intervenor Group 7 stated that “CMP’s [a]mendment presents a straight-forward alternative warranting consideration and approval by the [Department] and [the Commission] [sic] The [Merrill Strip Alternative] clearly meets the [Commission’s] land use standards, the [Department’s] Site Law and NRPA standards, and is preferable to the originally proposed alignment of the [proposed] Project in the vicinity of Beattie Pond and through the Beattie Pond P-RR subdistrict.”³⁴

In response to Intervenor comments, CMP stated that “the evidence demonstrates that the Merrill Strip Alternative alignment meets the [Commission’s] land use standards and the Site Law and NRPA standards, and is preferable to alignment of the [proposed] Project through the Lowelltown P-RR subdistrict. In sum, the [proposed] Project as modified by the Merrill Strip Alternative meets all Site Law and NRPA approval standards, and [Commission] certification requirements.”³⁵

The Commission considered all relevant testimony and documents in the record for this proceeding. Regarding alternatives for locating the proposed Project outside of the P-RR subdistricts, CMP has proposed the Merrill Strip Alternative to address the relevant Chapter 10 criteria. As a result, no portion of the proposed Project, as amended to include the Merrill Strip Alternative, would be located within the Beattie Pond P-RR subdistrict. The Merrill Strip Alternative is located in a General Management subdistrict in which a utility facility is a use allowed with a permit. As such, the Commission’s special exception analysis, including the alternatives analysis, does not apply to this portion of the proposed Project.

f. Appalachian Trail P-RR subdistrict alternatives analysis

The Commission has established a 200-foot wide P-RR subdistrict centered on the entire length of the Appalachian Trail within its jurisdictional area. The proposed Project would cross the P-RR subdistrict in three locations at the Appalachian Trail adjacent to Moxie Pond in Bald Mountain Township. At this location, the Appalachian Trail is located in an existing CMP corridor containing a 115-kilovolt transmission line. One of the three proposed Appalachian Trail crossings is located at an area referred to as Joe’s Hole, which crossing is depicted in Figure 25-4 of CMP’s Site Law application and in “Photosimulation 50: Troutdale Road, Bald Mountain Twp” included as Appendix D of CMP’s December 7, 2018, response to an additional information request.

³³ Intervenor Group 3’s Comments in Support of the Merrill Strip Alternative and CMP’s Request for Prompt LUPC Deliberation, page 2

³⁴ Intervenor Group 7’s Comments of Western Mountains & Rivers Corporation on Merrill Strip Alternative, page 5.

³⁵ CMP’s Objection and Reply of Central Maine Power Company to Public Comments and to Intervenor Comments and Testimony, pages 13-14.

The cleared portion of CMP's existing corridor in the Appalachian Trail P-RR is approximately 150 feet wide. CMP proposes to widen the clearing by an additional 75 feet on the southern side of the corridor to accommodate the new HVDC transmission line. The resulting cleared portion of the corridor in this location would be 225 feet wide. Portions of six proposed HVDC transmission structures would be visible from the Appalachian Trail P-RR and co-located within an existing CMP transmission line corridor.

CMP's witness testified that while the existing corridor intersects the P-RR subdistrict near the Troutdale Road, the proposed clearing associated with the proposed Project is entirely outside the P-RR and in a Residential Development subdistrict. CMP's witness introduced Applicant Exhibit "Cross-1" depicting the location of the proposed clearing associated with the proposed Project and the zoning boundaries for the P-RR subdistricts.³⁶ Based on information provided by CMP regarding the extent and location of vegetative clearing at the proposed Appalachian Trail crossing, the Commission finds that the proposed Project crosses the Appalachian Trail P-RR in two rather than the three locations identified in the September 2017 Site Law application.

CMP stated in their Site Law application that "[t]he configuration of the [Appalachian Trail], within and adjacent to an approximately 3,500-foot long portion of transmission line corridor, prevented CMP from avoiding direct impacts to the subdistrict through the siting of the transmission line structures. As a result, one of five transmission line structures in this portion of the Project corridor is located within the P-RR subdistrict." CMP additionally stated that "[a]lternative alignments of the transmission line to meet the purpose and need of the [proposed] Project would result in crossings of the Appalachian Trail in one or more locations where there are no existing transmission line corridors. Co-location of the transmission line within the existing transmission line corridor is therefore the least environmentally-damaging practicable alternative."³⁷

In 1987, CMP granted to the United States of America an easement for the Appalachian Trail to cross CMP's land.³⁸ Pursuant to the easement, CMP reserves the right to construct electric transmission lines in the corridor that the Appalachian Trail crosses. With respect to undergrounding at the proposed Appalachian Trail crossing, CMP's witness testified that CMP would have to acquire the underground rights from the United States National Park Service and CMP has not sought to acquire such rights. Intervenor Group 4 argued that CMP, as part of its alternative analysis, should have initiated discussions with private land owners, the National Park Service, and the Maine Appalachian Trail Club to explore the potential alternative of relocating the Appalachian Trail outside CMP's corridor.³⁹

Additional numerical cost analysis information concerning the proposed crossing of the Appalachian Trail provided by CMP on May 17, 2019, included estimates for undergrounding the proposed transmission line at the Appalachian Trail crossing. The estimated cost of an underground alternative for the approximately 1.0 mile of transmission line within the Appalachian Trail P-RR is \$29.8 million, or 3.13% of the overall proposed Project cost of approximately \$950 million. CMP's

³⁶ CMP witness Peggy Dwyer, hearing transcript, April 2, 2019, pages 143-145.

³⁷ Site Law application section 25.3.1.3.

³⁸ CMP prefiled rebuttal testimony, exhibit CMP-9-B.

³⁹ Intervenor Group 4 post-hearing brief, page 9.

witness testified that underground construction is a not a practicable or reasonable alternative and that underground construction would have increased environmental impacts, increased impacts to the public and increased cost to overhead construction. CMP argued that undergrounding of the transmission line at Joe's Hole would require a large hydraulic rig to be set up next to the Appalachian Trail for several months causing significant noise and visual impacts and would require construction of termination stations within site of the trail.⁴⁰ CMP did not address whether the timing of such construction could be coordinated during a period of reduced trail use to minimize the impacts on trail users.

Intervenor Groups 2 and 10 argued that the proposed Project will “degrade the hiking experience for users of the Appalachian Trail. It would be the first crossing of the [Appalachian Trail] by a transmission line of this size anywhere in the state.”⁴¹

Intervenor Group 4 argued that “[t]he widening of the corridor and the addition of a second much larger line would significantly increase the visual impact of these transmission line crossings on users of the [Appalachian Trail].” “The proposed [P]roject would greatly exceed the size, in both height and clearing width, of any existing transmission line crossing of the [Appalachian Trail] in Maine, and increase the sense of users that the trail at this location crosses a developed landscape.” “We agree that creating a new crossing of the [Appalachian Trail] where none currently exists is not a preferable alternative. However, there are at least three other potential alternatives that have not been adequately explored: routing the project along existing roads to avoid this [Appalachian Trail] crossing, relocating the [Appalachian Trail], or burying the line at the proposed [Appalachian Trail] crossing.” Intervenor Group 4 argues that CMP has not met the burden to demonstrate that the proposed Project satisfies the requirements for a special exception to cross the P-RR subdistrict at the Appalachian Trail.⁴²

g. Commission findings and conclusions regarding the Appalachian Trail P-RR subdistrict alternatives analysis

The Commission considered all relevant testimony and documents in the record for this proceeding. Regarding alternatives for locating the proposed Project outside of the Appalachian Trail P-RR subdistrict, the Commission finds most credible CMP's testimony and other evidence provided by CMP. The Commission finds that alternative routes for crossing the Appalachian Trail are not suitable because they would cross the Appalachian Trail in places not already impacted by an existing transmission line.⁴³

Undergrounding at the Appalachian Trail P-RR would necessitate construction of termination stations that would be visible to remote recreational hikers and necessitate the positioning of a large hydraulic drilling rig next to the trail for several months which would result in greater noise and visual impacts than the construction of the proposed overhead transmission lines.

⁴⁰ CMP witness Justin Bardwell, hearing transcript, May 9, 2019, page 343; CMP's post-hearing brief, p. 27.

⁴¹ Intervenor Groups 2 and 10 post-hearing brief, page 7.

⁴² Intervenor Group 4 post-hearing brief and proposed finding of facts, pages 6-8.

⁴³ CMP witness Brian Berube, hearing transcript, April 2, 2019, page 170.

The Commission considers cost as a factor in evaluating whether an alternative is reasonably available to an applicant. CMP's estimated costs associated with undergrounding the transmission line in the Appalachian Trail P-RR subdistricts is \$29.8 million (or 3.13% of the overall proposed Project).

Overall, as compared to the proposed overhead transmission line, undergrounding at the Appalachian Trail P-RR subdistrict would necessitate the use of more heavy equipment, longer construction time, greater disruption to traffic, additional temporary environmental impacts, construction of permanent access roads, and higher construction costs. Both overhead and undergrounding methods of installing a transmission line result in some environmental and scenic impacts within the P-RR subdistrict. The Commission finds that, on balance, the benefit to recreational users on the Appalachian Trail of undergrounding the transmission line does not outweigh the environmental, technological, logistical, and financial implications of using this methodology in the Appalachian Trail P-RR subdistrict and is therefore not suitable to the proposed use or reasonably available to the applicant.

h. P-WL subdistrict alternatives analysis

The Wetland Protection subdistrict includes the area enclosed by the normal high water mark of surface water bodies, including coastal and freshwater wetlands and rivers, streams and brooks, within the Commission's jurisdictional area. Freshwater wetlands means "[f]reshwater swamps, marshes, bogs and similar areas that are inundated or saturated by surface or groundwater at a frequency and for a duration sufficient to support, and which under normal circumstances do support, a prevalence of wetland vegetation typically adapted for life in saturated soils and not below the normal high water mark of a body of standing water, coastal wetland, or flowing water." Ch. 10, § 10.02(87).

The Commission's Chapter 10 describes three categories of coastal or freshwater wetlands included in P-WL subdistricts: P-WL1, P-WL2, and P-WL3. Ch. 10, § 10.23(N)(2)(a).

The Department considers impacts to freshwater wetlands, including the wetlands zoned as P-WL, in its review of the proposed Project pursuant to the NRPA and the Department's related rule, Wetlands and Waterbodies Protection, 06-096 C.M.R. ch. 310. The Commission's Protected Natural Resource standards set forth in Ch. 10, § 10.25(P) are therefore duplicative and not considered by the Commission in its certification decision.

In preparing its NRPA application, CMP provided an alternatives analysis that identified wetlands and water bodies generally one acre and larger that are listed in the National Wetlands Inventory maps developed by the United States Fish and Wildlife Service, which would be crossed by the proposed Project. CMP considered and favored transmission line routes that minimized crossings of wetlands and water bodies to minimize unavoidable temporary (e.g., construction mat crossings) and permanent (e.g., habitat conversion, filling) impacts to these resources. CMP concluded that frequency of wetland occurrence per mile of transmission line corridor is greater along the route

alternatives than along the preferred route for which it seeks permits. As such, a route meeting the purpose and need of the proposed Project and reasonably available to CMP could not be found without similar or greater impact to P-WL subdistricts.⁴⁴

CMP's preferred alternative route, for which it seeks permits, includes 76.3 acres of mapped wetland impacts compared to 118.3 acres for Alternative 1 and 113.3 acres for Alternative 2.⁴⁵ CMP's application identifies that the proposed Project would cross P-WL subdistricts a total of 34 times.⁴⁶ CMP did not provide information regarding the number of crossings of P-WL subdistricts the two alternative routes would involve.

The Commission finds that the proposed Project would intersect a total of 73 individually zoned P-WL subdistricts. A summary of the locations and wetland category for each crossing is provided in Table 3 below. A total of two transmission structures, identified in Table 4 below, are located within the P-WL subdistricts.⁴⁷ The primary impact to wetlands from the proposed Project would be the conversion of forested wetlands to scrub-shrub wetlands and emergent wetlands. The footprint of the two proposed transmission structures within P-WL3 wetlands would result in permanent impacts.

Table 3. Location and category of P-WL wetlands within the proposed Project area.

Location	Nearest Transmission Structure	Wetland Category
Appleton Township	3006-723	P-WL1: Wetlands of Special Significance
	3006-727	P-WL2: Scrub-shrub Wetlands
	3006-728	P-WL3: Forested Wetlands
	3006-731	P-WL3: Forested Wetlands
	3006-754	P-WL1: Wetlands of Special Significance
Bald Mountain Township	3006-436	P-WL1: Wetlands of Special Significance
	3006-436	P-WL3: Forested Wetlands
	3006-440	P-WL3: Forested Wetlands
	3006-441	P-WL3: Forested Wetlands
	3006-447	P-WL2: Scrub-shrub Wetlands
	3006-453	P-WL3: Forested Wetlands
	3006-463	P-WL1: Wetlands of Special Significance
	3006-483	P-WL1: Wetlands of Special Significance
	3006-483	P-WL1: Wetlands of Special Significance
Bradstreet Township	3006-667	P-WL2: Scrub-shrub Wetlands
	3006-667	P-WL1: Wetlands of Special Significance

⁴⁴ Site Law application, section 25.3.2. CMP's alternatives analysis is included in section 2.0 of its NRPA application.

⁴⁵ CMP Witness Gerry Mirabile, prefiled direct testimony, pages 19-20.

⁴⁶ Site Law application, section 25.3.2.

⁴⁷ CMP's August 13, 2018, response to additional information request.

	3006-671	P-WL2: Scrub-shrub Wetlands
	3006-678	P-WL1: Wetlands of Special Significance
	3006-678	P-WL2: Scrub-shrub Wetlands
	3006-680	P-WL1: Wetlands of Special Significance
	3006-682	P-WL3: Forested Wetlands
	3006-685	P-WL1: Wetlands of Special Significance
	3006-687	P-WL3: Forested Wetlands
	3006-687	P-WL2: Scrub-shrub Wetlands
	3006-687	P-WL1: Wetlands of Special Significance
	3006-688	P-WL1: Wetlands of Special Significance
Concord Township	3006-354	P-WL3: Forested Wetlands
	3006-357	P-WL3: Forested Wetlands
	3006-361	P-WL3: Forested Wetlands
	3006-365	P-WL1: Wetlands of Special Significance
	3006-365	P-WL3: Forested Wetlands
	3006-365	P-WL2: Scrub-shrub Wetlands
	3006-365	P-WL3: Forested Wetlands
	3006-366	P-WL3: Forested Wetlands
	3006-370	P-WL2: Scrub-shrub Wetlands
	3006-375	P-WL2: Scrub-shrub Wetlands
	3006-376	P-WL2: Scrub-shrub Wetlands
	3006-376	P-WL3: Forested Wetlands
	3006-378	P-WL3: Forested Wetlands
	3006-708	P-WL1: Wetlands of Special Significance
Hobbs town Township	3006-703	P-WL1: Wetlands of Special Significance
	3006-708	P-WL3: Forested Wetlands
	3006-710	P-WL3: Forested Wetlands
	3006-721	P-WL2: Scrub-shrub Wetlands
Johnson Mountain Township	3006-588	P-WL2: Scrub-shrub Wetlands
	3006-599	P-WL3: Forested Wetlands
	3006-614	P-WL2: Scrub-shrub Wetlands
	3006-650	P-WL2: Scrub-shrub Wetlands
Moxie Gore	3006-540	P-WL3: Forested Wetlands
	3006-541	P-WL3: Forested Wetlands
	3006-543	P-WL3: Forested Wetlands
	3006-548	P-WL3: Forested Wetlands
Skinner Township	3006-770	P-WL2: Scrub-shrub Wetlands
T5 R7 BKP WKR	3006-693	P-WL2: Scrub-shrub Wetlands
	3006-693	P-WL3: Forested Wetlands
	3006-694	P-WL3: Forested Wetlands

	3006-694	P-WL3: Forested Wetlands
	3006-694	P-WL3: Forested Wetlands
	3006-695	P-WL3: Forested Wetlands
	3006-700	P-WL1: Wetlands of Special Significance
	3006-700	P-WL3: Forested Wetlands
	3006-702	P-WL1: Wetlands of Special Significance
	3006-702	P-WL3: Forested Wetlands
	3006-703	P-WL1: Wetlands of Special Significance
	3006-703	P-WL3: Forested Wetlands
	3006-704	P-WL3: Forested Wetlands
	3006-705	P-WL3: Forested Wetlands
The Forks Plantation	3006-502	P-WL2: Scrub-shrub Wetlands
	3006-502	P-WL1: Wetlands of Special Significance
	3006-502	P-WL1: Wetlands of Special Significance
	3006-530	P-WL3: Forested Wetlands
West Forks Plantation	3006-566	P-WL3: Forested Wetlands
	3006-567	P-WL3: Forested Wetlands

Table 4. Proposed transmission structures located within P-WL subdistricts.

Structure Number	Subdistrict	Location	Natural Resource Map Number
3006-541	P-WL3	Moxie Gore	Segment 1 - Map 113
3006-548	P-WL3	Moxie Gore	Segment 1 - Map 110

Capable tree species include, but are not limited to, fir, spruce, oaks, pines, maples, birches, poplar, elm, beech, and basswood.⁴⁸ CMP developed a Construction Vegetation Clearing Plan which describes the restrictive management practices required for protected natural resources, including freshwater wetlands, during vegetation clearing associated with proposed Project construction.⁴⁹ CMP also developed a Post-Construction Vegetation Maintenance Plan which describes the restrictive maintenance requirements for protected natural resources within the transmission line corridor and applies to routine maintenance.⁵⁰

i. Commission findings and conclusions regarding the P-WL subdistrict alternatives analysis

The Commission finds that the two alternative routes analyzed by CMP would result in greater wetland impact than CMP's preferred alternative for which it seeks permits. In addition, the Commission finds that the trench method of installing transmission lines, as discussed by Mr.

⁴⁸ Site Law application, section 10.1.

⁴⁹ Site Law application, exhibit 10-1.

⁵⁰ Site Law application, exhibit 10-2.

Bardwell, would necessitate excavation of a trench through each wetland area resulting in temporary wetland impacts from the removal of vegetation and disturbance of soils. The underground trench alternative would also involve permanent changes in wetland vegetation, including the conversion of forested wetland to scrub-shrub wetland. Mr. Bardwell testified to the cost of horizontal directional drilling beneath wetlands. The Commission finds that the cost of horizontal direction drilling beneath wetlands would be cost prohibitive and not an alternative that is reasonably available for the 73 individually zoned P-WL subdistricts within the Commission's jurisdictional area. In consideration of all the evidence, the Commission concludes that there is no alternative site which is both suitable to the proposed use and reasonably available to the applicant relative to the P-WL subdistricts.

SPECIAL EXCEPTION BUFFERING ANALYSIS

The special exception criteria for the P-RR and P-WL subdistricts require that the use can be buffered from those other uses and resources within the subdistrict with which it is incompatible. For purposes of Chapter 10, the proposed Project use is a utility facility. Because components of the proposed Project will be visible, the Commission considers visual screening of the proposed use from other uses and resources with which it is incompatible to determine whether the proposed use is sufficiently buffered.

CMP submitted a visual impact assessment, prepared by Terrence J. DeWan & Associates. CMP's visual impact assessment, which includes photosimulations, examines the potential scenic impact of the transmission line from 32 key observation points, including the site of the proposed Kennebec River crossing, and the site of the proposed crossing of the Appalachian Trail.^{51,52}

The Department contracted with Dr. James F. Palmer, Scenic Quality Consultants, an independent scenic consultant, to assist in the Department's review of the evidence submitted on scenic character. Given the overlap of the Department's scenic character review with the Commission's consideration of scenic impacts as they relate to the buffering special exception criterion, the Commission considered Dr. Palmer's review of CMP's visual impact assessment.

⁵¹ Site Law application, section 6.16, Appendix D, Photosimulations I and IA; section 6.16, Appendix D, Photosimulations 10, 10A, 10B, 11, and 11A; and section 6.16, Appendix E.

⁵² The perspective of some key observation points is from private property. In its prefiled direct testimony, Wagner Forest testified that "the inclusion of photos and photo simulations from private lands, including those from our managed property, taken without our consent. This project will pass through several miles of private working forests, which only allow public recreational access at the sole discretion of the individual landowners. Based on recent public comments regarding the NECEC project, it is apparent this access privilege is misunderstood by many in the public. We ask you to not encourage this misunderstanding by considering photos or simulations from viewpoints that occur on private land." The photosimulations provided for the Kennebec River, Beattie Pond and the Appalachian Trail were not taken from lands owned by Wagner Forest.

In siting the proposed Project, and specifically the segments within the P-RR subdistricts, CMP stated that it maximized the use of natural buffers, such as topography and intervening vegetation, to maintain visual buffers, and also sited the proposed new transmission line within existing transmission line corridors.⁵³

a. Kennebec River P-RR buffering analysis and conclusions

As stated above, the proposed use is a utility facility. The P-RR subdistrict extends 250 feet from the normal high water mark on each side of the Kennebec River. Existing uses of the Kennebec River at the site of the proposed crossing include recreational whitewater rafting, kayaking, and fishing. CMP's proposed crossing of the river using underground horizontal directional drilling technology would result in no project components being visible from this P-RR subdistrict.

CMP proposed to retain a forested buffer of approximately 1,200 in length within the corridor between the northwest shoreline and the termination station and a forested buffer of approximately 1,000 in length will be preserved within the corridor between the southeast shoreline and the termination station. Updated photographic simulations and computer model images of the proposed HDD crossing, submitted by CMP with its October 19, 2018, Site Law application amendment, demonstrate that no components of the proposed Project would be visible from the Kennebec River P-RR subdistrict.

Intervenor Groups 2 and 10 argued that “[t]he West Forks has seen over 100,000 people a year recreate on their two class A Rivers – the Kennebec River Gorge and the Dead River – for whitewater boating, commercial and private rafting as well as canoeing, kayaking and fishing”; that no level of buffering can protect the use of recreational whitewater rafting on this type of river; that “CMP has failed to meet the special exception criterion regarding buffering”; and that “[n]o visual assessment has been done or study of what damage directional drilling will do to the surrounding area, Kennebec Gorge or the cold stream fisheries located just below the crossing.”⁵⁴ The Commission disagrees. Specifically, the proposed undergrounding of the transmission line at the Kennebec River crossing will prevent the proposed Project from being seen by users of the river. Based on CMP's photosimulations, the Commission finds that CMP's revised proposal to underground the line within the Kennebec River P-RR would entirely avoid scenic impacts within the Kennebec River P-RR subdistrict. The Commission concludes that CMP's proposed Project will be buffered from those other uses and resources within the Kennebec River P-RR subdistrict with which it is potentially incompatible because no portion of the proposed Project will be visible within or from the P-RR subdistrict on either side of the river, provided CMP, for the life of the project, maintains a vegetative buffer at the Kennebec River necessary to provide visual screening (buffering) of all transmission line structures in accordance with Condition #1 of this Site Law Certification.

⁵³ CMP post-hearing brief, page 8 (footnotes omitted).

⁵⁴ Intervenor Groups 2 and 10 post-hearing brief, pages 8, 20, and 52; Intervenor Groups 2 and 10 post-hearing brief, page 8.

b. Appalachian Trail P-RR buffering analysis and conclusions

The Appalachian Trail, a resource of national as well as world-wide significance, valued for the scenic qualities that surround it, is a nearly 2,200-mile trail stretching from Georgia to Maine. Maine's portion of the Appalachian National Scenic Trail ("Appalachian Trail") stretches from Mount Success on the New Hampshire border to Mount Katahdin in Baxter State Park. Of the 281 miles of the Appalachian Trail in Maine, almost all are located in the Commission's jurisdictional area. The Appalachian Trail in Maine is identified as one of the distinctive recreational resources used by recreational hikers. The Commission has placed P-RR subdistricts on approximately 300 miles of hiking trails, including nearly the entire Appalachian Trail within Maine.⁵⁵

CMP's summary of visual impact ratings for leaf-off snow cover describes the visual impact of the proposed Project at the [Appalachian Trail] crossing on Troutdale Road as "strong."⁵⁶ CMP proposes to utilize vegetative screening to reduce the visual impact of the proposed crossing of the Appalachian Trail P-RR. Native woody shrub species are proposed in CMP's "Joe's Hole (Moxie Pond) Planting Plan" submitted as Attachment J of CMP's August 13, 2018, response to additional information request. A total of 93 shrubs are proposed to be planted on either side of Troutdale Road in addition to maintaining non-capable vegetation within the corridor.

Intervenor Group 4 argued that "[a] special exception for construction of the proposed project should not be granted for the proposed transmission line crossing of the Appalachian Trail [] in Bald Mountain Twp....because CMP has not shown by substantial evidence that...the transmission line can be buffered from [Appalachian Trail] users."⁵⁷ "The widening of the corridor and the addition of a second much larger line would significantly increase the visual impact of these transmission line crossings on users of the [Appalachian Trail]" and that "no user surveys were conducted to actually assess users' expectations and reactions to the project."⁵⁸ "The proposed project would greatly exceed the size, in both height and clearing width, of any existing transmission line crossing of the [Appalachian Trail] in Maine, and increase the sense of users that the trail at this location crosses a developed landscape. CMP's contention that the impact on trail users would be 'negligible' is without foundation."⁵⁹ With regard to CMP's proposed planting plan for Joe's Hole, Intervenor Group 4 argued that "these plantings do not, and cannot, come close to buffering the existing use of the [Appalachian Trail], remote hiking, from the increased and incompatible impact of the wider corridor and additional much taller transmission line."⁶⁰

Where the Appalachian Trail intersects the proposed Project, it does so within an existing CMP corridor containing a 115-kilovolt transmission line. CMP argued, "[w]hile the location of the trail throughout this 3,500-foot section of existing transmission line corridor prevented CMP from entirely avoiding impacts within the P-RR subdistrict, the use of the [Appalachian Trail] in these

⁵⁵ Comprehensive Land Use Plan, pages 245, 247, 259, 273.

⁵⁶ CMP's Basis Visual Impact Form Summary Table, January 30, 2019.

⁵⁷ Intervenor Group 4 post-hearing brief, pages 6-7.

⁵⁸ Intervenor Group 4 post-hearing brief, page 7.

⁵⁹ Intervenor Group 4 post-hearing brief, page 8.

⁶⁰ Intervenor Group 4 post-hearing brief, page 10.

locations is not incompatible with transmission lines, as evidenced by both the existing use of the corridor by [Appalachian Trail] hikers and by the easement from CMP allowing such use and by which the National Park Service [] agreed to the construction by CMP of additional above ground electric transmission lines.... The Project will add additional transmission structures, but the character of the [Appalachian Trail] in this location will not change.”⁶¹ CMP stated,

CMP is willing to relocate the [Appalachian Trail] so that it crosses the CMP transmission line corridor only once in the vicinity of Troutdale Road, eliminating two existing crossings. Before CMP could commit to such a condition, though, the National Park Service [] would need to agree to it, and CMP would need to acquire, on behalf of [National Park Service], the necessary property interests in the new location. CMP has secured rights to a parcel that would allow a reroute that eliminates two of the transmission line crossings. However, because this reroute would pass by one or two camps, the Maine Appalachian Trail Club [] prefers the existing two crossings of the transmission line corridor. CMP will continue to explore all options to find a new route that is satisfactory to [the Maine Appalachian Trail Club] and [the National Park Service]. In the interim, CMP is working with [the Maine Appalachian Trail Club] on an interim relocation that will eliminate two crossings but will approach the edge of the [proposed Project]. Provided this interim alignment is ultimately acceptable to [the Maine Appalachian Trail Club] and [the National Park Service], CMP will pay for the cost of the realignment, including any appropriate buffer plantings. CMP’s long-term goal is to secure a permanent re-route acceptable to both [the Maine Appalachian Trail Club] and [the National Park Service], and CMP is willing to commit the necessary funds to this end.⁶²

The Commission encourages CMP’s willingness to work with the National Park Service and the Maine Appalachian Trail Club to relocate the Appalachian Trail in the vicinity of the existing and proposed new crossing of the trail by the transmission line corridor.

Intervenor Groups 2 and 10 argued, “[t]he proposed [P]roject will also degrade the hiking experience for users of the Appalachian Trail. It would be the first crossing of the [Appalachian Trail] by a transmission line of this size anywhere in the state.”⁶³ Intervenor Group 4 testified, “the Appalachian Trail passes through an existing transmission line corridor containing 115 kilovolt transmission line three times at the southern end of Moxie Pond. The existing towers are about 45 feet high, less than the height of the surrounding forested vegetation. The proposed project would widen this corridor by 50 percent and install a second transmission line with towers that are 100 feet tall, more than twice the height of the existing towers and significantly taller than the surrounding forest.”⁶⁴ “As proposed the project fails the second criteria for a special exception in that this

⁶¹ CMP post-hearing brief, pages 10-11.

⁶² CMP post-hearing brief, page 10, footnote 40.

⁶³ Intervenor Group 4 proposed findings of fact, page 7.

⁶⁴ Hearing transcript, April 2, 2019, page 97.

increased impact cannot be buffered from existing uses. The opportunity exists to improve rather than degrade the users' experience by relocating the trail in this area. [The Commission] should condition the granting of the special exception on a resolution of this issue between [CMP] and [Appalachian Trail] trail managers.”⁶⁵

The existing transmission line predates the Appalachian Trail and the P-RR subdistrict at the proposed location for the new crossing, and numerous transmission line structures are visible from the three areas where the proposed Project would cross the trail this area. CMP's easement to the United States of America for the Appalachian Trail states that the easement

...shall not be interpreted or exercised to, in any way, interfere with [CMP's] erection, construction, maintenance, repair, rebuilding, respacing, replacing, operation, patrol and removal of electric transmission, distribution and communication lines consisting of suitable and sufficient poles and towers with sufficient foundations, together with wires strung upon and extending between the same for the transmission of electric energy and intelligence, together with all necessary fixtures, anchors, guys, crossarms, and other electrical equipment and appurtenances, or the clearing and keeping clear Tract 108-04 of all trees, timber and bushes growing on said tract only by such means as [CMP] may select which do not interfere with the footpaths continuity or endanger hiker's passing along the footpath.⁶⁶

Although the proposed Project would increase the width of vegetative clearing in the transmission corridor and the height of the proposed transmission pole structures would be considerably higher than the existing transmission poles, the Commission finds that these conditions were contemplated at the time the easement was granted.

In consideration of all the evidence, the Commission concludes that the proposed Project, given the visibility of the existing transmission line, will be adequately buffered from those other uses and resources within the subdistrict with which it is incompatible, namely primitive recreational hiking on the Appalachian Trail, provided the vegetative planting described in CMP's "Joe's Hole (Moxie Pond) Planting Plan" is installed and maintained for the life of the project in accordance with Condition #2 of this Site Law Certification.

c. P-WL subdistrict buffering analysis and conclusions

The Wetland Protection subdistrict provides protection to areas that serve as important habitat for terrestrial and aquatic species.⁶⁷ Uses within P-WL subdistricts vary depending on the type of

⁶⁵ Intervenor Group 4 witness David Publicover, prefiled direct testimony, pages 3-4.

⁶⁶ CMP prefiled rebuttal testimony, CMP to USA Easement, exhibit CMP-9-B.

⁶⁷ Comprehensive Land Use Plan, page 235.

wetland system. Examples of uses that occur within P-WL subdistricts include hunting, fishing, boating, bird watching, swimming, scientific research, and habitat for fish and wildlife.⁶⁸

Within Segment 1, the proposed Project would cross or traverse 480 freshwater wetlands and convert 8.23 acres of wetland to shrub-scrub wetland. Within Segment 2, the proposed Project would cross or traverse 147 freshwater wetlands and convert 1.13 acres of wetland to shrub-scrub wetland. Within Segment 3, the proposed Project would cross or traverse 227 freshwater wetlands and convert 5.65 acres of wetland to shrub-scrub wetland. The Department reviews all freshwater wetland impacts pursuant to the NRPA, which requires measures for avoidance and minimization of proposed wetland impacts and compensation for wetland impacts that are unavoidable.

Regarding the Commission's special exception criterion that the use can be buffered from those other uses and resources within the subdistrict with which it is incompatible, CMP stated,

A wetlands functions and values assessment [] was performed for the [proposed] Project and is included in Attachment 12 of the NRPA application. The [functions and values assessment] concluded that none of the functions or values identified within forested wetlands would be eliminated or significantly diminished by the conversion of forested wetlands to scrub-shrub and emergent wetlands, and that, on balance, there will be a positive net benefit with regards to functions and values. As a result, the construction of the transmission line in accordance with the methods described in Section 10 (Buffers) of the Site Law Application is consistent with the objective of the P-WL subdistrict.⁶⁹

CMP's proposed Post-Construction Vegetation Maintenance Plan describes the restrictive maintenance requirements for protected natural resources within the transmission line corridor and specifies that shrub and herbaceous vegetation will remain in place to the extent possible. The Post-Construction Vegetation Maintenance Plan identifies the following procedures to be implemented during vegetation maintenance activities to protect sensitive natural resources:

- Protected resources and their associated buffers will be flagged or located with a Global Positioning System prior to all maintenance operations;
- Hand-cutting will be the preferred method of vegetation maintenance within buffers and sensitive areas, where reasonable and practicable;
- Equipment access through wetlands or over streams will be avoided as much as practicable by utilizing existing public or private access roads, with landowner approval where required;

⁶⁸ A detailed discussion of wetland functions and values for areas that would be impacted by the proposed Project is included in section 12.0 of CMP's NRPA permit application.

⁶⁹ Site Law application, section 25.3.2.

- Equipment access in upland areas with saturated soils will be minimized to the extent practicable to avoid rutting or other ground disturbance;
- Significant damage to wetland or stream bank vegetation, if any, will be repaired following completion of maintenance activities in the area; and
- Areas of significant soil disturbance will be stabilized and reseeded following completion of maintenance activity in the area.⁷⁰

The Post-Construction Vegetation Maintenance Plan provides that vegetation maintenance within, and within 25 feet of, freshwater wetlands with standing water will be conducted only by hand cutting with hand tools or chainsaws. Herbicides will not be used in Segment 1. In other segments, the Post-Construction Vegetation Maintenance Plan provides that herbicide use would occur in wetlands only when no standing water is present in the wetland at the time of the application.

To the extent that the proposed Project is incompatible with any resources in the P-WL subdistricts, the Commission finds that the proposed Project will be buffered from any such resources, provided CMP complies with the Post-Construction Vegetation Maintenance Plan as stipulated in Condition #3 of this Site Law Certification.

LAND USE STANDARDS

The Commission must determine whether the proposed Project meets any land use standards established by the Commission that are not considered in the Department's review under the Site Law.⁷¹

a. Vehicular Circulation, Access and Parking, Ch. 10, §§ 10.24(B) and 10.25(D)

In considering this land use standard, the Commission evaluates whether the proposal ensures adequate provision has been made for loading, parking and circulation of land; traffic movement in, on and from the site; and for assurance that the proposal will not cause congestion or unsafe conditions with respect to existing or proposed transportation arteries or methods.

⁷⁰ CMP's Post-Construction Vegetation Maintenance Plan, Site Law application exhibit 10-2, December 2018, page 3.

⁷¹ 12 M.R.S. § 685-B(1-A)(B-1).

CMP stated:

There are approximately 125 miles of existing gravel roads primarily used for forest management that provide direct access to the Project from State Route 201 in Johnson Mountain Twp. Since the Project is an HVDC transmission line right of way, vehicular traffic would only result during construction (short-term) and maintenance (infrequent), and as such the Project is not expected to generate a significant amount of traffic. The Project will only access construction areas through the use public roads and existing land management roads. There will be no Level C road projects constructed in any P-RR subdistrict as a result of the Project.^[72]

Temporary, unpaved access roads through sections of the new transmission line corridor will need to be established for the clearing and construction phases of the Project. However, these access roads will be restored to pre-existing contours and revegetated once construction is complete and final restoration has been established. No new permanent roadways will be developed and project construction and maintenance related parking would primarily be in upland locations on the Project corridor or in existing developed areas. No on-street parking will be associated with this project.⁷³

CMP stated, “Poles will either be hauled in by truck or skidder or flown in via helicopter. In areas where access is suitable (e.g., level uplands near roads), trucks may be used. In areas with more difficult access, skidders or forwarders may be used to bring the poles to the proposed pole locations. In very remote areas or areas with extreme terrain, or during accelerated construction, helicopter transportation may be used.”⁷⁴

Access to the proposed Project for construction and maintenance would be over both public and private roadways. Public roadways may be under the jurisdiction of the Maine Department of Transportation, Franklin County, or Somerset County. Any vehicle transporting non-divisible loads

⁷² Level C Road Project means “[c]onstruction of new roads, and relocations or reconstruction of existing roads, other than that involved in level A or level B road projects; such roads shall include both public and private roadways excluding land management roads.” Ch. 10, § 10.02(112). Within P-RR subdistricts, Level C road projects may be allowed upon issuance of a permit as a special exception. Level A Road Project means “[r]econstruction within existing rights-of-way of public or private roads other than land management roads, and of railroads, excepting bridge replacements.” Ch. 10, § 10.02(110). Level A road projects are allowed without a permit subject to land use standards. Level B Road Project means “[m]inor relocations, and reconstructions, involving limited work outside of the existing right-of-way of public roads or private roads other than land management roads and of railroads; bridge reconstruction and minor relocations whether within or outside of existing right-of-way of such roads.” Ch. 10, § 10.02(111). Level B road projects are allowed upon issuance of a permit, subject to land use standards.

⁷³ Site Law application, section 25.4.3.

⁷⁴ NRPA application, section 7.2.1.6.

in excess of legal dimension and weight limits on roads and bridges maintained by the Maine Department of Transportation must obtain an overlimit permit from the Department of the Secretary of State, Bureau of Motor Vehicles. Municipalities may have their own restrictions and permitting systems in place and would have to be checked individually. Access over privately owned roadways would be subject to individual landowner approval and any terms or conditions so stipulated.

The Commission concludes that the proposed Project adequately provides for loading, parking and circulation of traffic, in, on and from the site, and assurance that the proposal will not cause congestion or unsafe conditions, provided CMP complies with all applicable regulations of the Maine Department of Transportation, Franklin County, and Somerset County in accordance with Condition #4 of this Site Law Certification.

b. Subdivision and Lot Creation, Ch. 10, §§ 10.24(F) and 10.25(Q)

In considering this land use standard, the Commission evaluates whether the proposal to place a structure upon any lot in a subdivision and whether any divisions of land comply with the Commission's laws and rules governing subdivisions. "Subdivision" means a division of an existing parcel of land into 3 or more parcels or lots within any 5-year period, whether this division is accomplished by platting of the land for immediate or future sale, by sale of the land or by leasing."⁷⁵ A lot or parcel that when sold or leased created a subdivision requiring a permit from the Commission is not considered a subdivision lot and is exempt from the permit requirement if the permit has not been obtained and the subdivision has been in existence for 20 or more years.⁷⁶

CMP provided a 20-year land division history, prepared by Curtis Thaxter, LLC, for all parcels within the proposed Project area that are within the Commission's jurisdictional area, except for parcels within Moxie Gore. CMP stated that it "acquired most of the 300-foot wide corridor located in Moxie Gore in a deed from T-M Corporation dated November 10, 1988 and recorded in the Somerset County Registry of Deeds in Book 1480, Page 89. This transaction was part of a land exchange and boundary line agreement with T-M Corporation in which CMP reconfigured part of its ownership that dated back to the early 1900s. The remainder of the proposed corridor in Moxie Gore crosses land along the Kennebec River that CMP currently owns. This land was also acquired by several deeds in the early 1900s."⁷⁷ The land division history prepared by Curtis Thaxter, LLC concludes that no unauthorized land divisions appear to have occurred within the twenty-year review period.

The Commission finds that CMP's proposal does not include the development of any structures on lots that are part of a subdivision and that the land division history provided by CMP demonstrates that CMP has not created a subdivision. The Commission concludes that the proposed Project complies with Ch. 10, §§ 10.24(F) and 10.25(Q).

⁷⁵ 12 M.R.S. § 682(2-A).

⁷⁶ 12 M.R.S. § 682-B (5).

⁷⁷ Site Law application, section 25.4.1.

c. Public’s Health, Safety and General Welfare – Ch. 10, § 10.24

The burden is upon the applicant to demonstrate by substantial evidence that the criteria for approval are satisfied, and that the public’s health, safety and general welfare will be adequately protected. In the context of utility facilities the applicant “generally must show that the proposed use[] will not burden local public facilities and services” including “fire and ambulance services.”⁷⁸

The Maine State Federation of Firefighters (“Firefighters Federation”), in a letter dated February 12, 2019, expressed concerns regarding fire and other emergency response capacities within the proposed Project area. The Firefighters Federation has a membership of over 6,000 firefighters of which many are volunteers within small departments in rural communities. The Firefighters Federation stated:

Several of our volunteer members, who serve areas within the proposed NECEC Corridor, contacted us to express their concerns for fire and safety response. These concerns focus not only on the major construction phases of the project, but also on significant risks that will be established and which will continue to exist long after construction crews have left the area and wide areas of high voltage power lines cross their jurisdictions. Further conversations and investigation indicate that to date, no evaluation, assessment, or documentation of the fire, emergency medical, terrorism and other risks, or the services and equipment needed to mitigate those risks, have been formally identified, discussed, studied, and/or reported on.

...

The first 100 miles of the proposed Corridor, including the 70 miles covered by the [Maine Forest Service] and Rangers, has only three (3) volunteer departments within a one-mile (1-mile) buffer of the proposed Corridor. These are the Bingham, Anson, and Solon Volunteer Fire Departments. This area has no staffed fire services and daytime coverage is extremely limited.

South of Bingham, and still within Somerset County, there are three (3) additional fire departments [within] a two-mile (2-mile) buffer of the proposed NECEC transmission line. These are the volunteer departments of Starks, Madison, and Industry. Once again, these three additional departments have no staffed fire services and daytime coverage is extremely limited.

...

⁷⁸ Comprehensive Land Use Plan, § 4.3.E.

Non-fire emergency medical services (EMS) paramedic response is provided by Upper Kennebec Valley Ambulance out of Bingham. Emergency transports are taken to Redington-Fariview [sic] Hospital, 35-miles away. Redington-Fariview [sic] hospital has a Lifeflight landing pad, with helicopter transport dispatched from Bangor, Lewiston, or Sanford, if available.

Concerns regarding the ability of emergency crews to respond to fires within the proposed Project in the Commission's jurisdiction were raised by Intervenor Group 2 and by members of the public.⁷⁹

CMP provided no evidence addressing the proposed Project's impact on fire and ambulance services. The Commission concludes that the public's health, safety and general welfare will be adequately protected provided CMP submits to the Commission, prior to commencing construction of the proposed Project, written agreement(s) with state, local, or private emergency services providers to ensure fire and emergency services are available at all times and at all locations of the proposed Project that are within the Commission's jurisdictional area during and following construction of the proposed Project in accordance with Condition #5 of this Site Law Certification.

d. Lighting – Ch. 10, § 10.25(F)

In considering this land use standard, the Commission evaluates whether the proposed activity will comply with standards for exterior light levels, glare reduction, and energy conservation.

CMP proposes no permanent operation of lights on transmission line structures installed within the Commission's jurisdiction. CMP does propose that temporary nighttime lighting may be necessary during construction of the proposed Project.

The Commission finds that temporary lighting proposed by CMP is anticipated to comply with the applicable standards and concludes that the proposed Project will comply with the lighting standards set forth at Ch. 10, § 10.25(F).

e. Activities in Flood Prone Areas – Ch. 10, § 10.25(T)

In considering this land use standard, the Commission evaluates whether all development in flood prone areas, including areas of special flood hazard, as identified by Flood Prone Area Protection subdistricts or Federal Emergency Management Agency Flood Boundary and Floodway, Flood Hazard Boundary or Flood Insurance Rate maps comply with the procedural requirements and development standards set forth in Ch. 10, § 10.25(T).⁸⁰

⁷⁹ Hearing transcript, April 2, 2019, pages 96, 202, 204; Hearing transcript, May 9, 2019, page 58; Hearing transcript, April 2, 2019 – Public Comment Session, pages 23, 37, 89, 106-107.

⁸⁰ The purpose and description of the Flood Prone Area Protection subdistrict is set forth in Ch. 10, § 10.23(C).

CMP stated that the proposed Project would cross one Flood Prone Area Protection subdistrict in Appleton Township. The only portion of the proposed Project that crosses a flood hazard area mapped by the Federal Emergency Management Agency is in Concord Township. CMP proposes no transmission line structures within a Flood Prone Area Protection subdistrict or within mapped 100-year floodplains within the Commission's jurisdictional area.

The Commission concludes that the proposed Project will not directly impact or increase the risk of flooding and will comply with Ch. 10, § 10.25(T).

f. Dimensional Standards – Minimum Setbacks, Ch. 10, § 10.26(D)

The Commission's dimensional requirements for minimum setbacks apply to all lots on which structural development is proposed, unless otherwise provided by Ch. 10, § 10.26(G).

In CMP's proposal, no proposed structures are located within the applicable roadway setbacks (75 feet in all subdistricts, except 30 feet in Residential Development and General Development subdistricts).⁸¹

All infrastructure associated with the proposed Project within the Commission's jurisdictional area will be at least 75 feet from all side and rear property lines.

Ch. 10, § 10.26(D)(2)(a) establishes a setback of 100 feet from the nearest shoreline of a flowing water draining less than 50 square miles, a body of standing water less than 10 acres in size, or a coastal wetland, and from the upland edge of non-forested wetlands located in Wetland Protection (P-WL1) subdistricts. Ch. 10, § 10.26(D)(2)(b) establishes a setback of 150 feet from the nearest shoreline of a flowing water draining 50 square miles or more and a body of standing water 10 acres or greater in size.

CMP stated that "[t]ransmission line structures and guy wires will be positioned outside of the setback requirements to the fullest extent practicable. However, the design of the transmission line is constrained by both topography and the presence of natural resources and other features (e.g., roadways). The transmission line was designed to place transmission line structures such that they avoid natural resource impacts to the maximum extent practicable while maintaining necessary safety clearances for the overhead conductors."⁸² As a result, CMP proposes 135 transmission line structures within the 100-foot shoreline setback due to the nature of the proposed Project, engineering constraints, and other design parameters.⁸³ CMP stated that only one transmission structure, Structure 3006-378, would be located within the 150-foot setback required by Ch. 10, § 10.26(D)(2)(b).

⁸¹ CMP's August 13, 2018, update to NRPA and Site Law Applications, page 5.

⁸² Site Law application, section 25.4.2.

⁸³ Structure numbers and the setback distances are provided in the table provided in CMP's August 13, 2018, update to NRPA and Site Law applications, page 6.

CMP requested an exception to the minimum setbacks in accordance with Ch. 10, § 10.26(G)(5), which states, in part, “[a]n exception may be made to the shoreline, road, and/or property line setback requirements for structures where the Commission finds that such structures must be located near to the shoreline, road, or property line due to the nature of their use.” Pursuant to Ch. 10, § 10.26(G)(19), the Commission may reduce the minimum setback requirements for guy wire anchors provided such reduction will not result in unsafe conditions.

The Commission finds that the linear nature of the proposed Project and requirement to maintain minimum safety clearances for the overhead conductors results in the placement of transmission structures in locations that cannot meet the Commission’s default setback distances from certain water bodies. The Commission finds that CMP has attempted to design the proposed Project in such a way as to avoid conflict with the shoreline setbacks to the greatest extent practicable and that the 135 proposed transmission structures and guy wire placements that do not meet shoreline setbacks is an operational necessity and will not result in unsafe conditions. The Commission concludes that the proposed Project complies with applicable dimensional standards for minimum setbacks.

g. Dimensional Standards – Maximum Structure Height, Ch. 10, § 10.26(F)

Pursuant to Ch. 10, § 10.26(F)(1)(b), the maximum structure height for commercial, industrial, and other non-residential uses involving one or more structures is 100 feet. Pursuant to Ch. 10, § 10.26(F)(2), within 500 feet of the normal high water mark of a body of standing water 10 acres or greater, is 30 feet. Pursuant to Ch. 10, § 10.26(F)(3), features of structures which contain no floor area such as chimneys, towers, ventilators and spires and freestanding towers and turbines may exceed these maximum heights with the Commission's approval.

CMP stated:

Transmission line structure heights are determined during project design based on a number of parameters governed by the safety standards of the National Electric Safety Code. Specifically, for safe operation of the line, the transmission line must be designed in a manner that provides adequate clearance from the ground to the maximum sag of the transmission line. Structure locations are placed, to the extent practicable, in a manner that avoids and spans protected natural resources. Additionally, topographic constraints, the presence of existing utilities, and the span length needed to place structures outside of sensitive areas often requires transmission line structures to be taller than 100 feet.⁸⁴

CMP has identified a total of 96 transmission line structures within the Commission’s jurisdictional area that would exceed the maximum structure height of 100 feet.⁸⁵ Additionally, four structures in

⁸⁴ Site Law application, section 25.4.1.F.

⁸⁵ See Site Law application, Table 25-4 for a listing of proposed structures that would exceed 100 feet in height.

the Merrill Strip Alternative would exceed the maximum structure height of 100 feet.⁸⁶ CMP does not propose any structures within 500 feet of a body of standing water 10 acres or greater.

The Commission finds that the proposed transmission structures contain no floor area and thus may exceed the 100-foot height limitation pursuant to Ch. 10, § 10.26(F)(3). The Commission concludes that the proposed Project is consistent with applicable dimensional requirements for maximum structure height.

h. Vegetative Clearing – Ch. 10, § 10.27(B)

The Commission has established vegetative clearing standards for areas within 250 feet of certain water bodies. Vegetation clearing activities not in conformance with these standards may be allowed upon issuance of a permit from the Commission provided that such types of activities are allowed in the subdistrict involved and that an applicant for such permit shows by a preponderance of the evidence that the proposed activity, which is not in conformance with the standards will be conducted in a manner which produces no undue adverse impact upon the resources and uses in the area.

Pursuant to Ch. 10, § 10.27(B)(1), a vegetative buffer strip shall be retained within either 30 or 50 feet of the right-of-way of any public roadway, depending on the subdistrict involved, and within either 75 or 100 feet of the normal high water mark of standing and flowing water bodies, depending on the type of water body in proximity to proposed structures. The Department retains jurisdiction over vegetative clearing subject to the NRPA, including clearing adjacent to standing and flowing waters.

Within the vegetative buffer strip, Chapter 10 requires that there shall be no cleared opening greater than 250 square feet in the forest canopy, and selective cutting of trees is permitted provided that a well-distributed stand of trees and other natural vegetation is maintained.⁸⁷

In Segment 1 of the proposed Project, CMP proposes to clear a 150-foot wide strip of capable vegetation to accommodate the new transmission line. In Segments 2 and 3, CMP proposes to clear a 75-foot wide strip of capable vegetation to accommodate the new transmission line.

Relating to road buffers, CMP stated,

Due to the nature of the [proposed] Project, the buffer strips identified in [Ch. 10,] § 10.27, B will be retained but the Project cannot conform to the selective cutting requirements associated with the maintenance of vegetation ([Ch. 10,] § 10.27, B, 2). The Project will maintain vegetative buffers in all scenarios but these buffers will not include capable vegetation that could grow to heights that would grow into the conductor

⁸⁶ Site Law amendment application, section 25.3.

⁸⁷ The Commission's rating system for a well-distributed stand of trees is set forth in Ch. 10, § 10.27(B), Table 10.27(B-1).

safety zone of the transmission line. A description of buffers and CMP vegetation clearing and maintenance practices is included in Section 10 of the Site Law application.⁸⁸

Section 10 of CMP's Site Law application describes the proposed natural resource buffers and clearing guidelines CMP will employ for the proposed Project. CMP stated that all tree species capable of growing into the conductor safety zone must be removed from the buffers during construction and be prevented from re-establishing during periodic scheduled vegetation maintenance operations. Selective transmission line corridor management techniques are discussed in Section 10 of the Site Law application and have also been incorporated into CMP's Construction Vegetation Clearing Plan and CMP's Post-Construction Vegetation Management Plan. The objective of CMP's proposed vegetative buffer management plan "is to maintain ecological values of resources without sacrificing the operational safety of the electric transmission line and associated conductors."⁸⁹ CMP proposes mechanized clearing, including motorized equipment, to prepare the corridor for construction. However, for periodic maintenance of the corridor, CMP testified that it "practices integrated vegetation management [], including the selective use of herbicides, to safely and effectively maintain its transmission line corridors in a scrub/shrub cover."⁹⁰ Within Segment 1, CMP testified that it will not apply herbicides but instead utilize mechanical methods for vegetation maintenance on this portion of the proposed Project.⁹¹ For portions of the proposed Project in which vegetative tapering is proposed or required, CMP stated that mechanized methods, primarily chainsaws, would be used to selectively remove capable vegetation.

CMP's Site Law application section 10.3, Buffer and Resource Protection Concepts, identifies that vegetative buffers are designed to:

- Prevent soil erosion and sedimentation of surface waters;
- Slow the velocity, increase the infiltration, and otherwise remove sediment and other contaminants in runoff before it enters surface waters;
- Reduce access of all-terrain vehicles to streams;
- Provide shade, to reduce the warming effect of sunlight (insolation) on water; and
- Provide cover and habitat for wildlife that use riparian and significant habitats.

CMP's proposed Construction Vegetation Clearing Plan specifies restrictive vegetation management requirements for sensitive areas within the proposed Project area including:

⁸⁸ Site Law application, section 25.4.6.

⁸⁹ Site Law application, section 10.2.

⁹⁰ CMP Witness Gerry Mirabile, supplemental testimony, page 4.

⁹¹ CMP Witness Gerry Mirabile, supplemental testimony, page 5.

- Wetlands and streams;
- Perennial streams within designated Atlantic salmon habitat;
- Significant vernal pools;
- Inland waterfowl and wading bird habitat;
- Deer wintering areas;
- Rare plant locations; and
- Locations over mapped significant sand and gravel aquifers.

On January 30, 2019, CMP submitted revisions to its Construction Vegetation Clearing Plan and Post-Construction Vegetation Management Plan to incorporate 100-foot buffers on perennial streams located in Segment 1, including all coldwater fisheries, waterbodies containing special concern, threatened, and/or endangered species, and outstanding river segments; and 75-foot buffers on all other streams. In addition, CMP proposes to employ tapered vegetation management areas to minimize the visual impact of the proposed Project from the summit of Coburn Mountain in Upper Enchanted Township and from Rock Pond in T5 R6 BKP WKR.

The Commission concludes that the proposed Project will be conducted in a manner which produces no undue adverse impact upon the resources and uses in the area provided CMP adheres to the vegetative clearing and maintenance as described its Construction Vegetation Clearing Plan and Post-Construction Vegetation Management Plan in accordance with Condition #3 of this Site Law Certification.

i. Pesticide Application – Ch. 10, § 10.27(I)

Pursuant to Ch. 10, § 10.27(I), pesticide application in any of the subdistricts will not require a permit from the Commission provided such application is in conformance with applicable state and federal statutes and regulations.

CMP proposes to use herbicide applications after initial clearing of the corridor is completed to gain control of vegetation growth. When control is achieved, treatment will typically occur as part of scheduled maintenance on a 4-year cycle or as needed to discourage the establishment of capable tree species. CMP would not use herbicides within the 53.5 miles of new corridor in Segment 1 of the proposed Project. For the remainder of the line, CMP stated that “[h]erbicides will be selectively applied to capable species, using low-pressure (hand-pressurized) backpack applicators, to prevent growth of individual capable specimens and to prevent regrowth of cut capable specimens. Individual capable specimens will be treated with herbicides, and no broadcast application will be done. CMP will not use herbicides within 25 feet of any waterbody or standing water. In addition, CMP will not use herbicides within 100 feet of a known well or spring or within 200 feet of any

known public water supply.”⁹² CMP also stated that “[h]erbicides will be used in strict accordance with the manufacturer’s [United States Environmental Protection Agency]-approved labeling and will not be applied directly to waterbodies or areas where surface water is present.”⁹³

The Commission concludes that the proposed use of herbicides complies with the Commission’s land use standards for pesticide application.

j. Signs – Ch. 10, § 10.27(J)

The Commission’s regulations pertaining to signs, set forth in Ch. 10, § 10.27(J)(2), establishes standards to ensure placement of signs does not produce undue adverse impact upon the resources and uses in the area.

CMP does not propose to install signs as part of the proposed Project within the Commission’s jurisdictional area. Traffic control signs and directional signs utilized during the proposed Project construction would be limited and temporary and do not require a permit pursuant to Ch. 10, § 10.27(J)(1)(d).

The Commission concludes that the proposed Project will comply with the Commission’s land use standards for signs.

FINAL CONCLUSIONS

1. The proposed Project is an allowed use in the General Development, Residential Development, General Management, Flood Prone Protection, Fish and Wildlife Protection, Great Pond Protection, and Shoreland Protection subdistricts.
2. The proposed Project is an allowed use in the Recreation Protection subdistricts provided CMP installs and maintains for the life of the project the vegetative plantings described in CMP’s “Joe’s Hole (Moxie Pond) Planting Plan” within the Recreation Protection subdistrict surrounding the Appalachian Trail.
3. The proposed Project is an allowed use in the Wetland Protection subdistricts provided CMP complies with its proposed Construction Vegetation Clearing Plan and Post-Construction Vegetation Maintenance Plan.

⁹² Site Law application, section 15.2.

⁹³ Site Law application, exhibit 10-1, section 2.2.

4. The proposed Project complies with all applicable sections of the Commission's land use standards provided CMP:
 - a. secures all necessary approvals from the Maine Department of Transportation, Franklin County, and Somerset County for the transportation of materials during and following construction of the proposed Project; and
 - b. submits, prior to construction, written agreement(s) with state, local or private emergency services providers to ensure fire and emergency services are available at all times and at all locations of the proposed Project that are within the Commission's jurisdiction during and following construction of the proposed Project.
5. The proposed Project is consistent with the policies of the Comprehensive Land Use Plan without additional conditions.

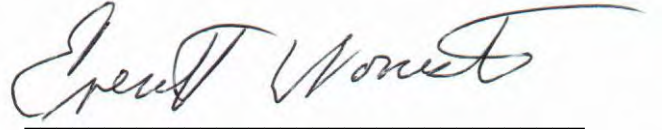
Therefore, the Commission CERTIFIES to the Maine Department of Environmental Protection that Site Law Certification SLC-9 for Central Maine Power's proposed New England Clean Energy Connect Project, as proposed, complies with the relevant provisions of the Commission's rule Chapter 10, subject to the findings of fact, conclusions, and conditions contained herein.

CONDITIONS

1. CMP shall, for the life of the project, maintain a vegetative buffer at the Kennebec River necessary to provide visual screening (buffering) of all transmission line structures from the Recreation Protection subdistrict.
2. CMP shall install and for the life of the project maintain the vegetative plantings described in CMP's "Joe's Hole (Moxie Pond) Planting Plan" within the Recreation Protection subdistrict surrounding the Appalachian Trail.
3. CMP shall comply with its Construction Vegetation Clearing Plan and Post-Construction Vegetation Management Plan.
4. CMP shall secure all necessary approvals from the Maine Department of Transportation, Franklin County, and Somerset County for the transportation of materials during and following construction of the proposed Project.
5. Prior to construction, CMP shall submit to the Land Use Planning Commission, written agreement(s) with state, local or private emergency service providers to ensure fire and emergency services are available at all times and at all locations of the proposed Project within the Commission's jurisdiction during and following construction of the proposed Project.

Pursuant to Ch. 4 § 4.11(12)(b), a determination to approve or deny a request for certification of a Site Law application pending before the Maine Department of Environmental Protection is not final agency action and is not appealable except as part of the Department of Environmental Protection permitting decision.

DONE AND DATED AT ORONO, MAINE, THIS 8th DAY OF JANUARY 2020.

A handwritten signature in dark ink, appearing to read "Everett Worcester", is written over a horizontal line.

Everett Worcester, Chair



DEP INFORMATION SHEET

Appealing a Department Licensing Decision

Dated: March 2012

Contact: (207) 287-2811

SUMMARY

There are two methods available to an aggrieved person seeking to appeal a licensing decision made by the Department of Environmental Protection's ("DEP") Commissioner: (1) in an administrative process before the Board of Environmental Protection ("Board"); or (2) in a judicial process before Maine's Superior Court. An aggrieved person seeking review of a licensing decision over which the Board had original jurisdiction may seek judicial review in Maine's Superior Court.

A judicial appeal of final action by the Commissioner or the Board regarding an application for an expedited wind energy development (35-A M.R.S.A. § 3451(4)) or a general permit for an offshore wind energy demonstration project (38 M.R.S.A. § 480-HH(1)) or a general permit for a tidal energy demonstration project (38 M.R.S.A. § 636-A) must be taken to the Supreme Judicial Court sitting as the Law Court.

This INFORMATION SHEET, in conjunction with a review of the statutory and regulatory provisions referred to herein, can help a person to understand his or her rights and obligations in filing an administrative or judicial appeal.

I. ADMINISTRATIVE APPEALS TO THE BOARD

LEGAL REFERENCES

The laws concerning the DEP's *Organization and Powers*, 38 M.R.S.A. §§ 341-D(4) & 346, the *Maine Administrative Procedure Act*, 5 M.R.S.A. § 11001, and the DEP's *Rules Concerning the Processing of Applications and Other Administrative Matters* ("Chapter 2"), 06-096 CMR 2 (April 1, 2003).

HOW LONG YOU HAVE TO SUBMIT AN APPEAL TO THE BOARD

The Board must receive a written appeal within 30 days of the date on which the Commissioner's decision was filed with the Board. Appeals filed after 30 calendar days of the date on which the Commissioner's decision was filed with the Board will be rejected.

HOW TO SUBMIT AN APPEAL TO THE BOARD

Signed original appeal documents must be sent to: Chair, Board of Environmental Protection, c/o Department of Environmental Protection, 17 State House Station, Augusta, ME 04333-0017; faxes are acceptable for purposes of meeting the deadline when followed by the Board's receipt of mailed original documents within five (5) working days. Receipt on a particular day must be by 5:00 PM at DEP's offices in Augusta; materials received after 5:00 PM are not considered received until the following day. The person appealing a licensing decision must also send the DEP's Commissioner a copy of the appeal documents and if the person appealing is not the applicant in the license proceeding at issue the applicant must also be sent a copy of the appeal documents. All of the information listed in the next section must be submitted at the time the appeal is filed. Only the

extraordinary circumstances described at the end of that section will justify evidence not in the DEP's record at the time of decision being added to the record for consideration by the Board as part of an appeal.

WHAT YOUR APPEAL PAPERWORK MUST CONTAIN

Appeal materials must contain the following information at the time submitted:

1. *Aggrieved Status.* The appeal must explain how the person filing the appeal has standing to maintain an appeal. This requires an explanation of how the person filing the appeal may suffer a particularized injury as a result of the Commissioner's decision.
2. *The findings, conclusions or conditions objected to or believed to be in error.* Specific references and facts regarding the appellant's issues with the decision must be provided in the notice of appeal.
3. *The basis of the objections or challenge.* If possible, specific regulations, statutes or other facts should be referenced. This may include citing omissions of relevant requirements, and errors believed to have been made in interpretations, conclusions, and relevant requirements.
4. *The remedy sought.* This can range from reversal of the Commissioner's decision on the license or permit to changes in specific permit conditions.
5. *All the matters to be contested.* The Board will limit its consideration to those arguments specifically raised in the written notice of appeal.
6. *Request for hearing.* The Board will hear presentations on appeals at its regularly scheduled meetings, unless a public hearing on the appeal is requested and granted. A request for public hearing on an appeal must be filed as part of the notice of appeal.
7. *New or additional evidence to be offered.* The Board may allow new or additional evidence, referred to as supplemental evidence, to be considered by the Board in an appeal only when the evidence is relevant and material and that the person seeking to add information to the record can show due diligence in bringing the evidence to the DEP's attention at the earliest possible time in the licensing process or that the evidence itself is newly discovered and could not have been presented earlier in the process. Specific requirements for additional evidence are found in Chapter 2.

II. OTHER CONSIDERATIONS IN APPEALING A DECISION TO THE BOARD

1. *Be familiar with all relevant material in the DEP record.* A license application file is public information, subject to any applicable statutory exceptions, made easily accessible by DEP. Upon request, the DEP will make the material available during normal working hours, provide space to review the file, and provide opportunity for photocopying materials. There is a charge for copies or copying services.
2. *Be familiar with the regulations and laws under which the application was processed, and the procedural rules governing your appeal.* DEP staff will provide this information on request and answer questions regarding applicable requirements.
3. *The filing of an appeal does not operate as a stay to any decision.* If a license has been granted and it has been appealed the license normally remains in effect pending the processing of the appeal. A license holder may proceed with a project pending the outcome of an appeal but the license holder runs the risk of the decision being reversed or modified as a result of the appeal.

WHAT TO EXPECT ONCE YOU FILE A TIMELY APPEAL WITH THE BOARD

The Board will formally acknowledge receipt of an appeal, including the name of the DEP project manager assigned to the specific appeal. The notice of appeal, any materials accepted by the Board Chair as supplementary evidence, and any materials submitted in response to the appeal will be sent to Board members with a recommendation from DEP staff. Persons filing appeals and interested persons are notified in advance of the date set for Board consideration of an appeal or request for public hearing. With or without holding a public hearing, the Board may affirm, amend, or reverse a Commissioner decision or remand the matter to the Commissioner for further proceedings. The Board will notify the appellant, a license holder, and interested persons of its decision.

III. JUDICIAL APPEALS

Maine law generally allows aggrieved persons to appeal final Commissioner or Board licensing decisions to Maine's Superior Court, see 38 M.R.S.A. § 346(1); 06-096 CMR 2; 5 M.R.S.A. § 11001; & M.R. Civ. P 80C. A party's appeal must be filed with the Superior Court within 30 days of receipt of notice of the Board's or the Commissioner's decision. For any other person, an appeal must be filed within 40 days of the date the decision was rendered. Failure to file a timely appeal will result in the Board's or the Commissioner's decision becoming final.

An appeal to court of a license decision regarding an expedited wind energy development, a general permit for an offshore wind energy demonstration project, or a general permit for a tidal energy demonstration project may only be taken directly to the Maine Supreme Judicial Court. See 38 M.R.S.A. § 346(4).

Maine's Administrative Procedure Act, DEP statutes governing a particular matter, and the Maine Rules of Civil Procedure must be consulted for the substantive and procedural details applicable to judicial appeals.

ADDITIONAL INFORMATION

If you have questions or need additional information on the appeal process, for administrative appeals contact the Board's Executive Analyst at (207) 287-2452 or for judicial appeals contact the court clerk's office in which your appeal will be filed.

Note: The DEP provides this INFORMATION SHEET for general guidance only; it is not intended for use as a legal reference. Maine law governs an appellant's rights.

Attachment I
Attestation that CMP agrees to the partial transfer of the MDEP
permits to NECEC LLC



ATTESTATION

Gerry J. Mirabile, being duly sworn, under oath, states that he is Manager – NECEC Permitting at Central Maine Power Company (“CMP”) and as such is duly authorized to certify on behalf of CMP that CMP agrees to the transfer to NECEC Transmission LLC of the Site Law and Natural Resource Protection Act permits and water quality certification for the following components of the New England Clean Energy Connect Transmission Project (permits L-27625) approved by an Order of the State of Maine Department of Environmental Protection dated May 11, 2020.

- New Section 3006 – 145.1-mile 320kV HVDC line from Merrill Road Converter Station to Canadian border;
- New Section 3007 – 1.2-mile 345kV AC line from Merrill Road Converter to Larrabee Road Substation;
- New Merrill Road HVDC Converter Station in Lewiston;
- New Moxie Gore Termination Station for Kennebec River HDD Crossing; and
- New West Forks Termination Station for Kennebec River HDD Crossing.

A handwritten signature in blue ink, reading "Gerry J. Mirabile".

Gerry J. Mirabile
Manager – NECEC Permitting
Central Maine Power Company

STATE OF MAINE)
) ss.
COUNTY OF ~~CUMBERLAND~~)
 Knox

Subscribed and sworn to (or affirmed) before me on this 24th day of September 2020, Gerry J. Mirabile, proved to me on the basis of satisfactory evidence to be the person who appeared before me.

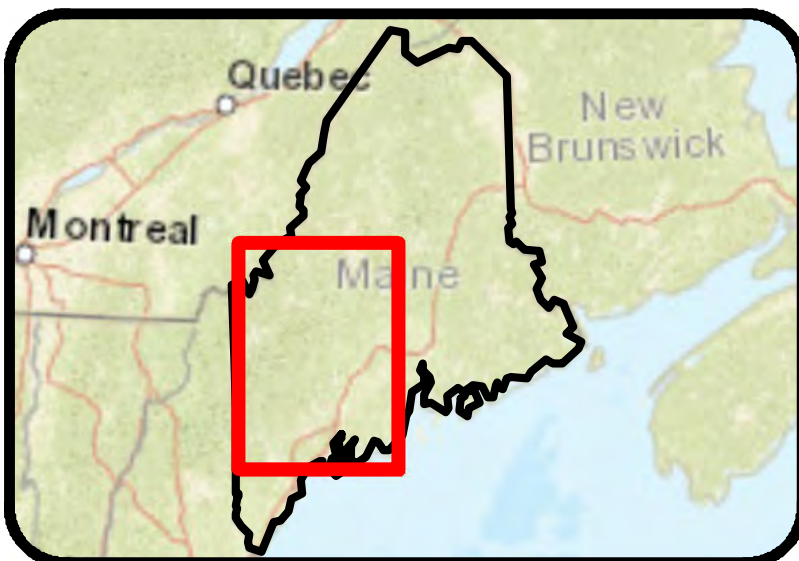
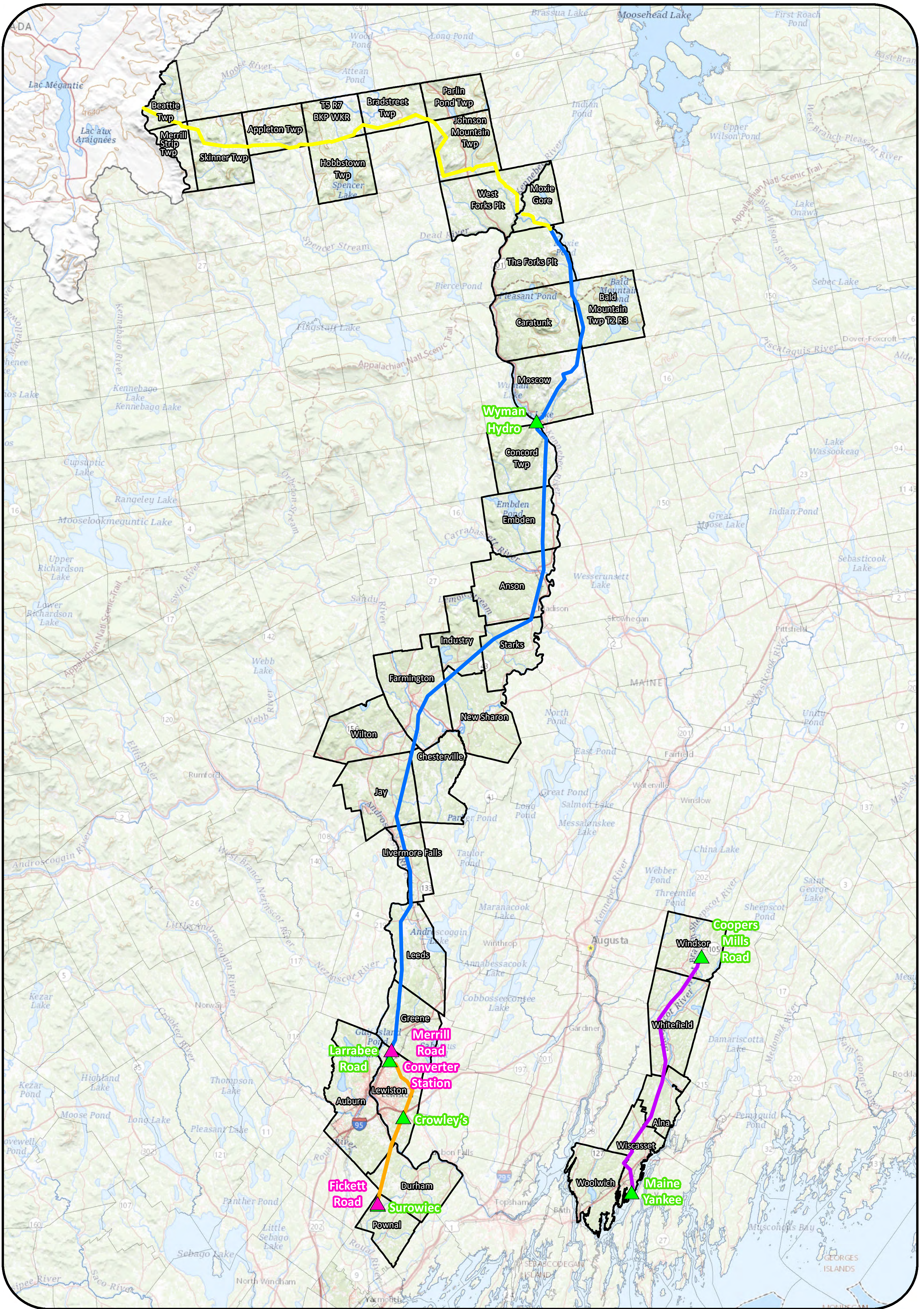
A handwritten signature in black ink, reading "Ezra J. Casas".

Notary Public

My Commission Expires:

EZRA J CASAS
Notary Public * State of Maine
My Commission Expires
November 09, 2022

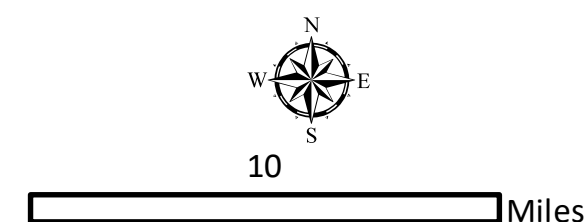
Attachment J
NECEC Location Map



Legend

- HVDC (New ROW)
- HVDC (Existing ROW)
- New 345 kV Line
- Rebuild Sections
- Existing Substation
- Proposed Substation

New England
Clean Energy Connect
Overview Map



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Use of New Technologies to Mitigate Visual Impact and Public Concerns Related to Siting of Transmission Lines

By Roger Rosenqvist, ABB Inc.

Introduction

Reliance on the transmission grid to meet load deliverability requirements in population centers continues to grow. New transmission capacity can enable delivery of enough generating capacity from remote resources to meet demands in densely populated urban areas. However, new overhead transmission lines often face fierce opposition from land-owners and communities along a proposed new route.

Evaluation of transmission capacity expansion options need to be thorough and should consider construction costs, permitting and timelines, as well as costs and schedule impacts of public hearing processes, environmental impact studies, easements, access roads, environmental restrictions, restoration and maintenance.

For example, a new overhead transmission line may initially appear to be the preferred option for increasing transmission capacity. However, public and land-owner opposition, environmental impact restrictions, and potential legal action by opponents may make project construction so uncertain – or delay the estimated in-service date so much – that the project may not be a viable option for resolving a looming transmission reliability problem.

Fortunately, continued research and incremental developments over the past several decades have provided reliable and proven equipment and technologies that are well suited to overcome today's transmission challenges. A prime example is installation of environmentally-friendly submarine or underground transmission within existing infrastructure rights-of-way for overhead transmission lines, roadways, railroads, gas lines, etc.

Today's Transmission Congestion Issues

Transmission congestion always has an adverse impact on electricity consumers cost and/or the environment. Transmission congestion occurs when actual or scheduled flows of electricity on a transmission line are restricted to below desired levels – either by the electrical capacity of the line or by operational restrictions created to protect the security and reliability of the grid. When a transmission constraint prevents the delivery of clean renewable electricity from a remotely located area to a load center, system operators must re-arrange the generation dispatch on both sides of the constraint, cut wholesale transactions previously planned, or, as a last resort, reduce electricity deliveries to consumers. When constraints prevent delivery of energy from cleaner or less expensive resources, energy that is deliverable from more expensive and/or higher emission resources must be used instead.



Boosting Transmission Capacity

In many areas where transmission capacity is already constrained by thermal limits of transmission lines or their associated equipment, construction of new transmission circuits may be the only feasible option to alleviate grid constraints and looming reliability problems. However, when faced with fierce public opposition against new overhead transmission lines, partial or complete undergrounding of a planned new transmission circuit may be the only practical solution. Undergrounding balances the construction costs of new transmission facilities with system reliability risks and transmission congestion costs from not completing needed transmission capacity expansion on time.

AC Cables for Short- and Medium-Distance Underground or Submarine Transmission

Polymer insulated cables have become a mature and proven technology for both high voltage ("HV") and extra high voltage ("EHV") electric transmission systems. Because these cables do not contain any insulating fluids, there is no risk of accidental release of oil or other hazardous materials and substances into the environment and the technology is a natural choice for construction of underground transmission line segments in sensitive areas.

Polymer insulated cables for alternating current (AC) transmission systems are commercially available today for conductor sizes up to 5,000 kcmil (approx. 2,500 mm²). Reliability performance of EHV class cable has been proven in numerous projects around the world since the early 1980's. More recently, high capacity 345 kV and 400 kV cross-linked polyethylene ("XLPE") insulated underground and submarine cables have been installed in large AC transmission projects in Connecticut, New York, Illinois, the United Kingdom, Germany, Denmark and Spain. Furthermore, the performance of 500 kV XLPE cables have been proven in AC transmission projects in China and Japan.

An XLPE insulated underground cable circuit can be directly buried in a 3-4 feet wide and 4-6 feet deep trench at the inside perimeter of an existing overhead transmission line right-of-way, or along the shoulder of a roadway or railroad. An XLPE insulated underground cable circuit can also be installed in a traditional duct bank system inside a roadway. Once installed, XLPE insulated cables are virtually maintenance free.

It should be noted, however, that the capacity rating of an underground or submarine AC transmission circuit diminishes with distance, limiting the practical application of EHV AC cable segments to short and medium distance. The primary reason is that the 60 Hz alternating voltage in the grid causes a flow of 60 Hz alternating current in the cable due to the repeated charging of the cable segment's electrical capacitance. Since the electrical capacitance increases cumulatively with the length of a cable segment, the 60 Hz current also increases cumulatively with the length. That, in turn, results in an upper length limitation beyond which it will no longer be practical to build AC transmission lines underground or underwater since most of the cable's capacity will be utilized by the charging current. For example, simply connecting a twenty-five (25) miles long 345 kV AC transmission cable segment to the grid will result in approximately 600 Amperes of alternating current even if the cable segment is disconnected at the other end and carries no real power.



DC Cables for Long-Distance Underground and Submarine Transmission

In response to industry demands for cost efficient long distance underground and submarine transmission systems, ABB introduced in the late 1990's XLPE insulated cable systems for high voltage direct current ("HVDC") transmission. Unlike AC transmission, there is no length limit for underground and submarine transmission segments using XLPE insulated HVDC cables. After the initial impulse of charging current at the energization of the cable segment, there will be no significant charging current flowing in the cable. Hence, the entire capacity rating of the cable can be utilized for transmission of real power regardless of the length of the underground or submarine segment.

The first commercial underground transmission system using XLPE insulated HVDC cables was commissioned in 1999 at a circuit rating of 160 kV (± 80 kV), 50 MW. The HVDC link, which is approximately 43 miles long, connects a large wind farm on the south end of the island of Gotland in the Baltic Sea to the island's principal population center, which is located on the northern end of the island. An HVDC underground circuit requires only two cables whereas an EHV AC underground circuit typically requires three cables plus a continuous ground cable for the sheath bonding at the splice locations.

Since the 1990's, XLPE insulated HVDC cables have been qualified and introduced for commercial use at incrementally higher circuit ratings. Voltage ratings up to ± 640 kV and ampacity ratings up to around 2000 amperes are now available. (HVDC cables can be manufactured with conductor sizes up to 6000 kcmil (approx. 3000 mm²). The incremental development of HVDC cables mirrors the development of XLPE insulated cable for increasingly higher AC voltage ratings since the 1970s and reflects the utility industry's conservative approach and preference for proven designs.

Long XLPE insulated HVDC underground and submarine circuits rated 300 kV (± 150 kV) were commissioned in 2002. Since 2015, HVDC underground and submarine cables circuits rated 640 kV (± 320 kV) have been in operation in multiple large transmission projects in Europe. Development has continued and HVDC cable ratings of 2000-2500 MW are likely to become a reality in the near future as available cable voltage ratings have increased to ± 500 kV and ± 640 kV.

Underground transmission lines with a capacity rating in excess of 2000 MW can now be directly buried in a 1½-2 feet wide and 4-6 feet deep trench at the inside perimeter of an existing overhead transmission line right-of-way, or along the shoulder of a roadway or railroad. Like XLPE insulated AC cable circuits, an HVDC underground cable circuit can also be installed in a traditional duct bank system inside a public roadway.

Grid Support and Benefits of Modern HVDC Voltage Source Converter Stations

In parallel with the development and introduction of XLPE cables for HVDC based long distance underground and submarine transmission, ABB developed and introduced a new generation of HVDC stations based on voltage source converter (VSC) technology. Compared to earlier generations of HVDC stations, today's HVDC VSC stations need no harmonic filtering equipment, include few mechanical switching devices, are much more



compact, and can easily be sited in densely populated urban areas with stringent requirements regarding audible noise and visual impact.

The characteristics of HVDC VSC stations are ideal for load center areas where local fossil fuel or nuclear based generation is retiring and replaced by renewable generation resources located in remote areas far away from the load. Unless new reactive power resources are added to the grid near load centers when local generators retire, the areas often face voltage stability issues and looming reliability problems if power is imported over long traditional AC transmission lines.

HVDC lines with VSC stations address such reliability issues by utilizing the inherent capability of the VSC technology to supply and absorb reactive power in a way that closely resembles a generator. That is, an HVDC transmission line with an HVDC VSC station at the receiving end can provide essentially the same local reactive and AC voltage support services to the grid near the load center as a local generator, even though the source of the real power may be located at a remote location with favorable wind and/or sun intensity conditions.

HVDC links with VSC stations can also provide critical black-start services to major load centers that were previously supplied by local fossil fuel based generators. By utilizing the inherent self-commutating capability of the VSC technology and power flow control on the HVDC line, the HVDC link can convert power from remotely located generators at the sending end of the link to a powerful 60 Hz power frequency resource at the receiving end that can quickly commence restoration of the electricity supply in a major metropolitan area after a major black-out event. Such black-start functionality is already implemented in several existing VSC based HVDC links and has been verified through elaborate field tests of the black-start mode, including energization of AC transmission lines and transformers from the HVDC station and support of the start-up of other generation facilities.



New HVDC Technology Lights the Future of Power Transmission

By Marc Jeroense

Growing populations among many countries around the world today are forcing resources to be more stretched. As the population grows, these nations need more land, not to mention adequate electrical, water and communication services. And these services must be provided in a way that complies with the now-compulsory environmental regulations.

For its part, the energy sector has been working hard to find safe and innovative ways of increasing power transmission in power corridors while keeping the environmental impact to a minimum.

In recent years, a few companies have developed transmission capabilities that not only bring more power to the people, but do so in a safe and invisible way. Using this new high voltage direct current (HVDC) cable, transmission systems are more compact and effective, require low maintenance and are environmentally friendly.

The earth's resources are becoming more and more limited. Building the infrastructure to satisfy growing population demands is quickly becoming a

critical issue. Whether they like it or not, energy, water and communication companies are now, more than ever, compelled to find ways of providing increased services using, in many cases, the same infrastructure in a more compact, effective and environmentally-friendly way.

The energy sector, for example, has been investigating ways of increasing power transmission in the already existing power corridors. Not only this but in the framework set by the European Commission in 2003, electrical trade between member countries must be increased. Because this is currently underdeveloped compared with other sectors of the economy, a larger number of inter-connectors must be built, either on land or at sea.



Photo 1 -- Submarine HVDC Light cables with polymeric insulation (photo courtesy of ABB)

[Click here to enlarge image](#)

In any case, to meet the demands of a growing population and tightening regulations, many service providers are faced with three very important questions:

- How can the power-per-square-meter of land usage be increased?
- How can the environmental effects with maintained or improved technology and/or reliability be reduced?
- How can the risks involved be handled?

Power Transmission in the Energy Sector

Today, most electrical power is transmitted with conventional alternating current (AC) because it is relatively simple to transform one voltage level to another. In rural areas, overhead lines are normally used for transmission over long distances while power cables are adequate for urban areas.

Submarine AC cables are used for limited distances in seas and lakes. However, AC transmission systems have some technical limitations, such as reactive power generation/consumption and no power flow control. Compensation techniques, such as FACTS devices, are used to limit the effects of reactive power generation/consumption. Additionally, when compared with overhead lines, AC cables have higher capacitive charging currents, thereby limiting their ability to transmit power over long distances. There are also environmental concerns regarding the electrical and magnetic fields surrounding overhead lines and AC cables.

These limitations can be eliminated if direct current (DC) transmission is used. A DC transmission system improves transmission capability, has lower losses and the transmission lengths are practically unlimited due to the elimination of the capacitive currents.

Additionally, DC transmission is very environmentally friendly. However, since electrical power is generated as AC in a power station and delivered as AC to the consumers, a HVDC transmission needs AC to DC and DC to AC conversion at each end. Two main techniques, the conventional current source converter (LCC) and the voltage source converter (VSC), are used to do this.

HVDC “Light” Transmission on Underground Cables

The classical HVDC technique was first introduced in Sweden in 1954 by ASEA. In the 1990s, a relatively new power transmission technology called HVDC Light was developed. It is also known as “the invisible power transmission” since it is based on underground cables.



Photo 2 -- HVDC Light cables are lightweight and oil-free. In operation, they have a neutral electro-magnetic field. (photo courtesy of ABB)

[Click here to enlarge image](#)

The main advantage of HVDC Light cables over their HVAC (high-voltage alternating current) counterparts is their reduced weight and dimensions, which result in a higher power density. In other words, the power that can be transported per kilogram of cable is higher for HVDC Light cables than for HVAC cables. The main reasons for this are:

- HVDC Light cables work at a higher electrical field stress, and because of this the cable insulation is thinner than that of HVAC cables.
- HVAC cable conductors must be dimensioned for skin effect losses, proximity effect losses, induced losses in screens and sheaths, and in the case of submarine cables, induced losses in armouring. HVDC Light cables have to be dimensioned only for their ohmic conductor losses.
- An HVAC cable system needs three cables whereas a HVDC cable system only needs two.

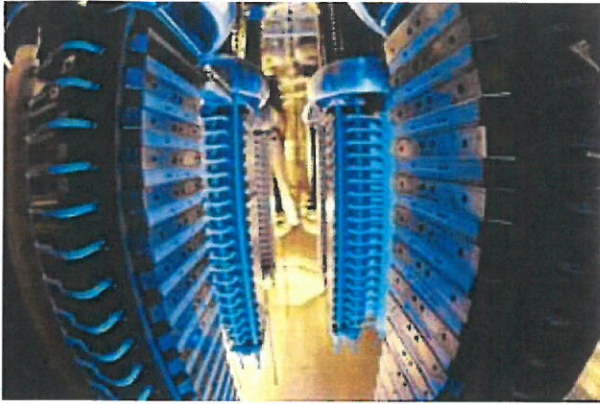


Photo 3 -- HVDC Light valves. HVDC Light valves convert electricity from AC into DC, so it can be transmitted over long distances with low losses; and from DC back into AC, so it can be used by consumers. (photo courtesy of ABB)

[Click here to enlarge image](#)

Polymer HVDC Light cable systems have been developed, installed and are in service on voltage levels from 80 kV to 150 kV. These installed systems cover power ranges from 50 MW to 350 MW.

It is foreseen that the future demand for HVDC transmission and in particular HVDC cables will increase. The fact that long electrical power transmission can be built underground make these new HVDC systems very attractive. Currently, the traditional market and technical driving force behind the use of HVDC cable systems is long-distance submarine transmission, which is necessary especially if asynchronous networks need to be connected together. But the introduction of VSC and extruded polymer HVDC cables has created new market potential for HVDC Light systems.

For example, remote locations with weak networks can now be easily connected to, as can off-shore wind power and oil and gas platforms. "Undergrounding" has been identified as a strong market driver. The forces behind this include new and demanding North American and European standards, more difficult and time consuming "permission processes" for overhead lines, and increasing public opinion that solutions with higher aesthetic values are needed.

Higher Reliability

The world's first commercial HVDC Light cable system was installed in Sweden in 1999. A major wind park on the southern tip of Gotland Island was connected to

the city of Visby, also located on Gotland, by an 80 kV, 50 MW connection. Since then, many other projects have been realized, including the Estlink project, a 150 kV, 350 MW link. In less than a decade, almost 1,500 km of HVDC Light cables have been installed, with another 400 km on the way.

On top of this, approximately 500 cable joints are now in service. This can be compared to the more than 1,700 km of mass impregnated cables installed by ABB since 1953.

Light Installation

The relatively low weight, small dimensions—which enable a reduced number of joints—and robustness of HVDC Light cables have a positive influence on installation costs, which constitute a significant part of the total investment cost. This, combined with newly developed land installation equipment, means that the cost ratios between overhead line systems and those based on HVDC polymer cables are—depending on the circuit length and conditions—comparatively low.



Photo 4 -- Laying HVDC Light cable in New Haven, Connecticut. (photo courtesy of ABB)

[Click here to enlarge image](#)

Nowadays, installation is aided by mechanized cable-laying machines with wheel cutters and automated backfilling devices. Existing infrastructures often have defined soil compositions and installation is easier if boulders, etc., can be avoided. In one project in Australia, HVDC Light cables were laid at a speed of one to three kilometers per day. This type of speed is possible only with HVDC Light technology and lean HVAC XLPE cable designs.

These light cables can be installed on land or at sea. Their relatively low weight and dimensions strongly influence the amount of cable that can be reeled up on one drum, or the amount that can be transported on a cable installation vessel.

Environmental Effects

Besides the economical benefits of using less land for transmission systems in existing infrastructures, the environmental impact of using HVDC Light is also reduced. For example, an overhead line system routed through a forest results in a loss of CO₂ uptake because trees convert carbon dioxide from the atmosphere into carbon stored in the wood. In fact, a 400 kV line through a forest represents a loss of approximately 42 tons of CO₂ per km per year.

The earth's magnetic field originates from large convective DC currents in its interior. This natural magnetic field varies from between 30 to 60 μ Tesla for different latitudes on the earth's surface. The same type of magnetic field is produced by an HVDC Light cable, and is not considered unhealthy to the human body.

A DC cable will generate a magnetic field of between 5 and 10 μ Tesla one meter above the ground surface. This will then be superposed to the natural magnetic field of the earth, which is much the same as saying that the magnetic effect from a DC cable corresponds to traveling from the south to the north of the earth. This is not considered dangerous from a magnetic point of view.

Safety

The laying and installing of cables along roads or other infrastructures is generally easier than in the countryside. Cable positions and locations can be defined according to the systems used to route roads or railways.

National road and railway administrations normally have very good systems for doing this. In Sweden all roads have fixed coordinates in a GPS system, which means that other services like electrical and fiber cables can be positioned and logged in the same system. Hence, the risk for third-party damage is reduced.



Photo 5 -- Laying the Estlink HVDC Light cable 2x75 km. HVDC Light cables can connect two countries or offshore wind farms by undersea. (photo courtesy of ABB)

[Click here to enlarge image](#)

Additionally, an HVDC Light system will reduce the short-circuit current to zero approximately 15–20 times faster than conventional AC lines and this will have a positive effect on the personal risks involved.

Non-invisible Benefits

The most obvious advantage of using HVDC Light cables for electrical transmission is that cables that are laid underground make the electrical energy transport invisible. This, together with the other advantages of using DC cables, such as environmental and safety-related features as well as the ability to transfer electricity over long distances, means that a more comfortable electrical transmission system is now easier to obtain.

About the Author:

Marc Jeroense is HVDC Project Manager for Grid Systems with ABB Power Systems, Raleigh, North Carolina.

Light and invisible

Underground transmission with HVDC Light

Dag Ravemark, Bo Normark

When power must be transmitted over long distances, overhead lines (OHL) have long been the prevailing technology. The costs and performance of buried cables made them unattractive as an alternative.

The advent of HVDC Light® is bringing about a huge change. Whereas buried cables are not suitable for long-distance high-voltage AC transmissions, the different behavior of DC fundamentally changes this.

The high costs of burying cables which has long made this mode unattractive is also losing ground as an argument. The combination of environmental concerns over the impact of overhead lines and the availability of new cost-saving technologies is leading to a re-think. Underground cables are now more attractive than ever before.



Grid flexibility

For over a century electrical transmission systems have been based mainly on overhead transmission lines (OHL). The main reason for this has been the cost advantage when compared to high-voltage underground transmission.

Recent studies suggest the cost premium of underground transmission is in the range of 5–15 times the traditional overhead transmission alternative. But this comparison is already dated. Two main factors are affecting the paradigm:

- Environmental restrictions are increasing the costs and implementation time for overhead transmission.
- Technological development significantly reduces the cost of underground transmission.

Consequences of environmental restrictions

There are several reasons why underground HVDC cables have a better environmental profile than overhead HVAC lines.

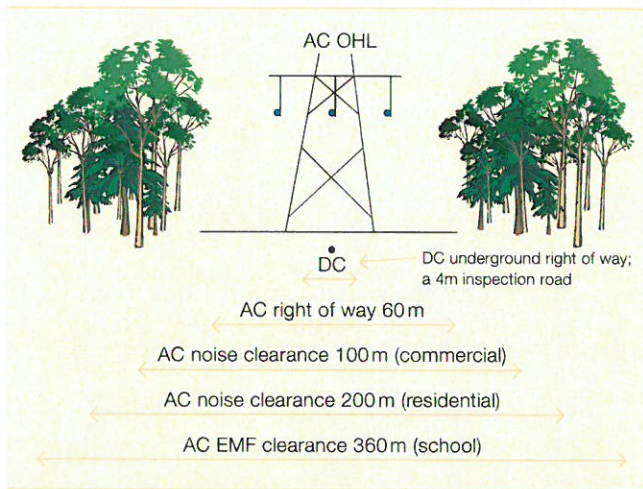
Land use

An HVDC cable uses significantly less land than an overhead HVAC line. The right-of-way for a 400 kV OHL can be a 60 m wide strip ¹ where no buildings/high trees are allowed whereas an underground DC cable needs at most a 4 m wide inspection road on top of it. For AC OHL the amount of land required for a 400 km transmission is 2,400 hectares (1 hectare = 10,000 m²). However only 160 hectares are required for DC cable (< 6 percent).

Audible noise

Restrictions on land use stretch beyond the immediate right-of-way. Audible noise from transmission line corona – most noticeable when conductors are wet in foggy weather conditions – might restrict buildings close to OHL. The width of this “noise corridor” depends on local noise ordinance as well as on the design and voltage of the line. Noise objections

1 Land use comparison for HVDC Light® and AC OHL transmission.



to obtain permits. An underground DC cable naturally has no audible noise emission.

EMF

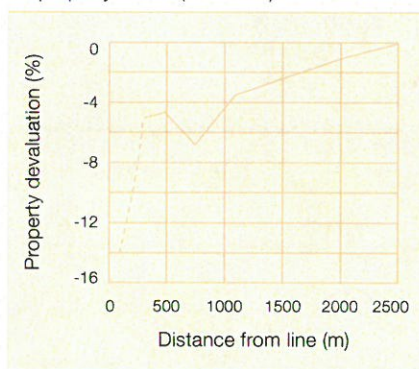
Magnetic and electrical fields can also restrict the use of land close to an OHL. In several countries a precautionary policy vis-à-vis magnetic fields is in force. The Swedish National Electrical Safety Board and the Dutch Ministry of Housing and Environment

both suggest a 0.4 μ T safety level for 50 Hz magnetic fields from transmission lines. This level corresponds to field levels normally encountered in city environments today. In contrast to an AC line, the field for a DC cable is static (non-radiant). Applying the same precautionary policy as for AC would not call for the provision of any “EMF corridor” around an underground DC cable. The field immediately above the cable is far less than the earth’s natural magnetic field.

Right-of-way as a loss of CO₂ sink

Growing forests are considered CO₂ sinks because trees convert carbon dioxide from the atmosphere into carbon stored in the form of wood and organic soil matter. A forest can absorb 9.2 tons of CO₂ per hectare per year. Building a 400 km, 400 kV overhead transmission line through an area that is 75 percent forest represents a loss of a carbon sink of 16,780 tons of CO₂ per year.

2 Effect of proximity of overhead line on property values (in Finland).



HVDC Light® technology was introduced in 1997 with a small test installation of 3 MW. Since then, both cables and converters have progressed dramatically in both size and performance.

Material use

The material intensity of an AC OHL is higher than a DC cable. The statistical material use per meter of transmission is compared in ^{Table 1}.

Table 1 Comparison of material usage

Material	DC underground	AC OHL
Aluminium	3.3 kg	2.1 kg
Copper	1.4 kg	
PVC	2.3 kg	
PEX	6.1 kg	
Steel		100.0 kg
Ceramics		0.3 kg
Concrete		376.3 kg
Total	13.1 ka	478.8 ka

Using lifecycle assessment (LCA) to analyze the “cradle to grave” material impact, the DC cable has an environmental impact of 64.5 kg of CO₂-equivalents per meter and the AC OHL has an impact of 365.4 kg of CO₂-equivalents per meter. In other words, the material used in the DC cable has only 17.6 percent the envi-

Grid flexibility

Aesthetics – Property value

Several studies have shown that property values are reduced close to OHL. For example, a study carried out in the United Kingdom showed the value of detached properties a distance of 100m from OHL were 38 percent lower than comparable properties. A Finnish study showed that the reduction is proportional to the distance from the line [2].

Assuming that every 500m along the 400 km line there is:

- One property 500m from the OHL (with 8 percent value reduction).
- Two properties 1000m from the OHL (with 4 percent value reduction).
- Three properties 2000m from the OHL (with 2 percent value reduction).

If an average property is valued at \$150,000, the reduction in property value along the 400 km OHL then amounts to a staggering \$25 million.

Electrical losses

When HVDC Light® underground transmission is used inside an AC-grid, the transmission system can be operated in a more optimal way leading to lower electrical losses. The losses in the HVDC line are equivalent to the loss reduction of the AC grid, ie, the HVDC line is considered to transmit electricity “without” losses. The more efficient operation of a transmission system with HVDC can be attributed to two causes: the average higher voltage level in the AC grid and the reduction of reactive power flows.

For example, on a 350 MW transmission (50 percent utilization) there are no HVDC losses whereas HVAC losses amount to 5 percent. This means the operator has 76,650 MWh more electricity to sell each year with an HVDC connection.

The overall electrical losses¹⁾ can be translated into 45,990 tons of CO₂ emitted per year.

Power system stability

HVDC systems can never become overloaded, and they offer additional

control power flow and voltage [3]. HVDC can be very effective in damping power oscillations, as well as avoiding or limiting cascading system disturbances, particularly when connecting two points inside the same AC-grid, ie, in parallel with AC-lines: an HVDC Light® converter is excellent at generating or consuming reactive power.

Technical characteristics of underground transmission system

When planning traditional overhead transmission lines, it is better to choose high voltage lines for transmission over large distances because not only can transmission capacity be increased but losses are also reduced. However, for AC transmission in underground cables the situation is somewhat different. If the voltage is increased, the reactive power absorption of the cable increases so that its technical maximum length is reduced rather than increased. The laws of physics in this case then work against long AC transmission. Today's experience of cable transmission suggests a maximum transmission distance of about 60km for a 345kV AC underground cable.

Reasons why underground HVDC cables have a better environmental profile than overhead HVAC lines include land use, audible noise, EMF, material use, and power systems stability.

HVDC Light®, a new transmission system designed for underground transmission

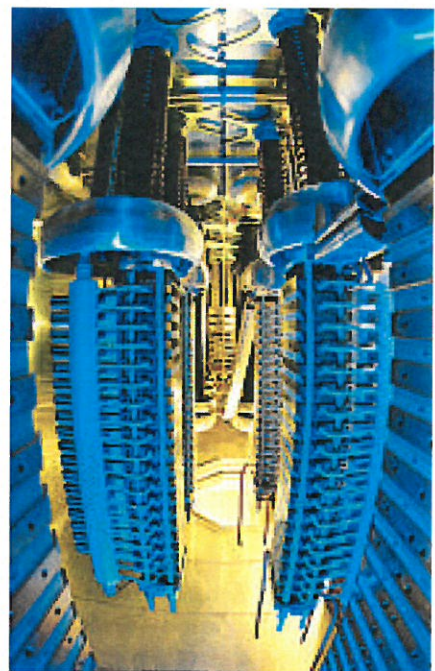
This technology is based on some key components:

- Extruded cable technology
- Converter technology
- Control and protection technology

Voltage source converters cause less stress on the cables than conventional HVDC converters and this has enabled

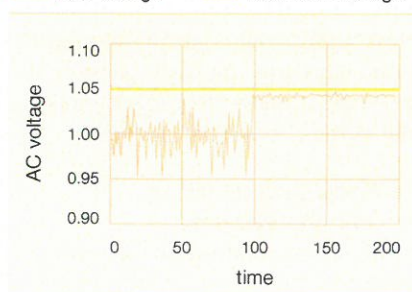
the development of extruded cables for HVDC. The extruded cable has some significant advantages over traditional mass impregnated cables. It:

- Is completely oil free.
- Has low weight.
- Is very flexible and this simplifies handling during installation.
- Has very simple prefabricated joints.



3 HVDC improves the stability of AC networks.

— Bus voltage — Maximum voltage



4 HVDC Light® product matrix.

— Available 2000 — Available 2004 — Available 2006

	500 A	1000 A	1500 A
DC Voltage	500 A	1000 A	1500 A
+/- 80 kV	90 MW	180 MW	280 MW
+/- 150 kV	170 MW	350 MW	500 MW
+/- 300 kV	350 MW	700 MW	1000 MW

Footnote

¹⁾ Using the OECD average of 600 kg CO₂/MWh for

Grid flexibility

5 Construction of Murraylink HVDC Light® (Australia).



Voltage source converters also show significant advantages over traditional HVDC converters such as:

- Dramatically smaller size. Typically they are half the height and their footprint is 25 percent smaller.
- Superior voltage and reactive power control reduces the risk of black-outs.
- They act as a “firewall” for network disturbances and block the cascading trips that occur in AC systems²⁾.
- They can operate in very weak networks and do not require network reinforcements.
- They reduce down time after outages with their “black start” capability.

New high-speed control and protection technology makes it possible to fully utilize the inherent benefits of the voltage source converters.

Technical development of HVDC Light® systems

HVDC Light technology was introduced to the market in 1997 with a small test installation of 3 MW. Since then, both cables and converters have progressed dramatically in both size and performance. Today the largest system in service is a 330 MW system operating at ± 150 kV. A 350 MW system is currently under construction. The converter design has been refined by the adoption of new switching schemes that reduce the number of components and cut the converter

In contrast to traditional HVDC, an HVDC Light® system is highly modularized and makes greater use of semi-conductors. The product matrix shown in 4 highlights available modules.

Increased environmental pressure on overhead transmission lines is both raising total costs and increasing the risk for substantial project delays.

Cable installation techniques

A crucial element in underground transmission is the cable installation technique. In the Murraylink project in Australia, 5 and 6, a very successful installation was implemented using modified pipeline installation equipment. Up to 3 km of cable was successfully installed per day. The total cost of laying the 170 km cable system amounted to the very reasonable sum of about AU\$ 10 million (\$7.6 million). HVDC Light cables have relatively low weight (typically <10 kg/m), making its installation similar to that of fibre-optic cables: the equipment used for trenching and the

depth at which the cables are laid is comparable (1 to 1.5 m below the surface).

Cost comparison Overhead lines – Underground transmission

The new HVDC technology has, as already mentioned, some unique characteristics particularly when it comes to increasing network security. This means before a strict cost comparison is performed, a needs evaluation is required. Some key checkpoints are listed in Table 2.

Table 2 HVDC suitability checklist

<input type="checkbox"/> Need for power transmission 50–1000 MW
<input type="checkbox"/> Need for accurate and fast control
<input type="checkbox"/> Distance more than 100 km
<input type="checkbox"/> Difficult to obtain permits for OHL
<input type="checkbox"/> Asynchronous networks
<input type="checkbox"/> Weak AC network
<input type="checkbox"/> Risk for dynamic instability
<input type="checkbox"/> Power quality issues
<input type="checkbox"/> Need for grid black start capability
<input type="checkbox"/> Need for high availability although occurrence of thunderstorms, wind storms/hurricanes or heavily icing conditions may apply
<input type="checkbox"/> Need for low maintenance
<input type="checkbox"/> Need for small footprint
<input type="checkbox"/> Risk of low harmonic resonances
<input type="checkbox"/> Need for fast voltage and reactive power control to enhance network security

Footnote

²⁾ See “HVDC: A ‘firewall’ against disturbances in high-voltage grids” Lennart Carlsson, ABB Review

Grid flexibility

If at least three of these conditions are fulfilled it is likely that an HVDC Light® system will offer a very attractive solution. If, however, OHL permits are difficult to obtain, then this reason alone is sufficient to warrant an HVDC Light® solution.

In the following paragraphs, two examples currently being studied are presented.

Case 1,700 MW over 400 km

It is assumed this case fulfils at least five of the criteria outlined in **Table 2**, such as:

- The need for 50–1000 MW.
- Transmission distance is greater than 100 km.
- Difficulty to obtain permits for OHL.
- Risk of dynamic instability.
- Need for fast voltage and reactive power control to enhance network security.

A comparison of the direct investment cost shows the following span: The direct investment cost for HVDC Light® option including converters, cables and their installation is in the range of \$275–\$420 million. The breadth of this range is primarily due to differences in installation costs and local market conditions.

For the AC overhead option there is an even greater span in cost. A study

made by ICF consultancy in 2001 shows a huge variation in costs from country to country. Using these data, the direct investment cost for the AC overhead option gives a cost range of \$130–\$440 million for the line including installation and substations.

At the direct investment cost level the price for the underground alternative is between 0.6 and 3.2 times the overhead option. This is quite a difference from the normally anticipated 5–15 times.

Furthermore, other factors should also be considered, for example:

- Additional investments in equipment to manage voltage and reactive power control in the AC case.
- Losses (both cases).
- Costs for permitting the overhead solution.
- Cost for permission and construction time (both cases).
- Increased transmission capacity in the existing AC grid (HVDC case).
- Loss of property value.

When these factors are included in the evaluation, the competitiveness of the HVDC alternative increases. Assume, for example, the following realistic additional factors for the overhead option:

- Additional reactive compensation: \$25 million.

- Loss of property value: \$25 million.
- Value of increased transmission capacity in existing AC grid: \$50 million.

Applying these factors raises the price tag of the AC alternative to between \$230 million and \$540 million, and that of the underground option to between \$275 million and \$420 million. The costs of the two alternatives are quite comparable and local factors determine which option is the most advantageous.

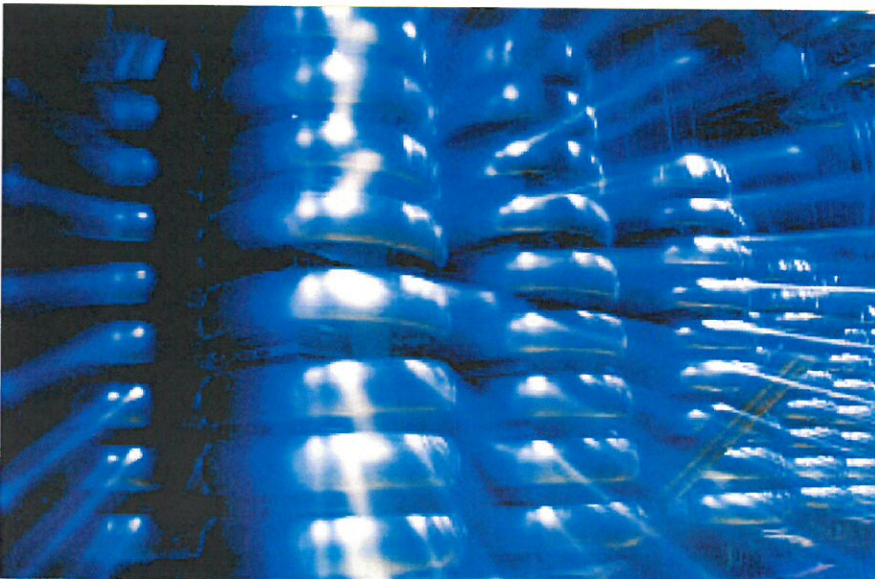
Case 2,350 MW over 100 km

A similar exercise for this case results in a direct investment cost for the HVDC option of between \$110 million and \$150 million, whereas the AC overhead version costs vary between \$40 million and \$90 million. The relative direct investment cost of the HVDC solution is in the range of 1.2–3.75 times that of an OHL. The application of the additional factors discussed above will again reduce the cost difference between the alternatives.

Conclusions

Increased environmental pressure on overhead transmission lines is both raising total costs and increasing the risk for substantial project delays. New HVDC technology in the form of HVDC Light® has made underground options technically feasible and economically viable. This is especially so if the new grid investment is driven by security of supply issues. The conventional view that an underground link will cost 5–15 times its overhead counterpart must be revised. Depending on local conditions, it is realistic that the costs for an underground high-voltage line are equal to that of traditional overhead lines.

6 HVDC Light® valve.

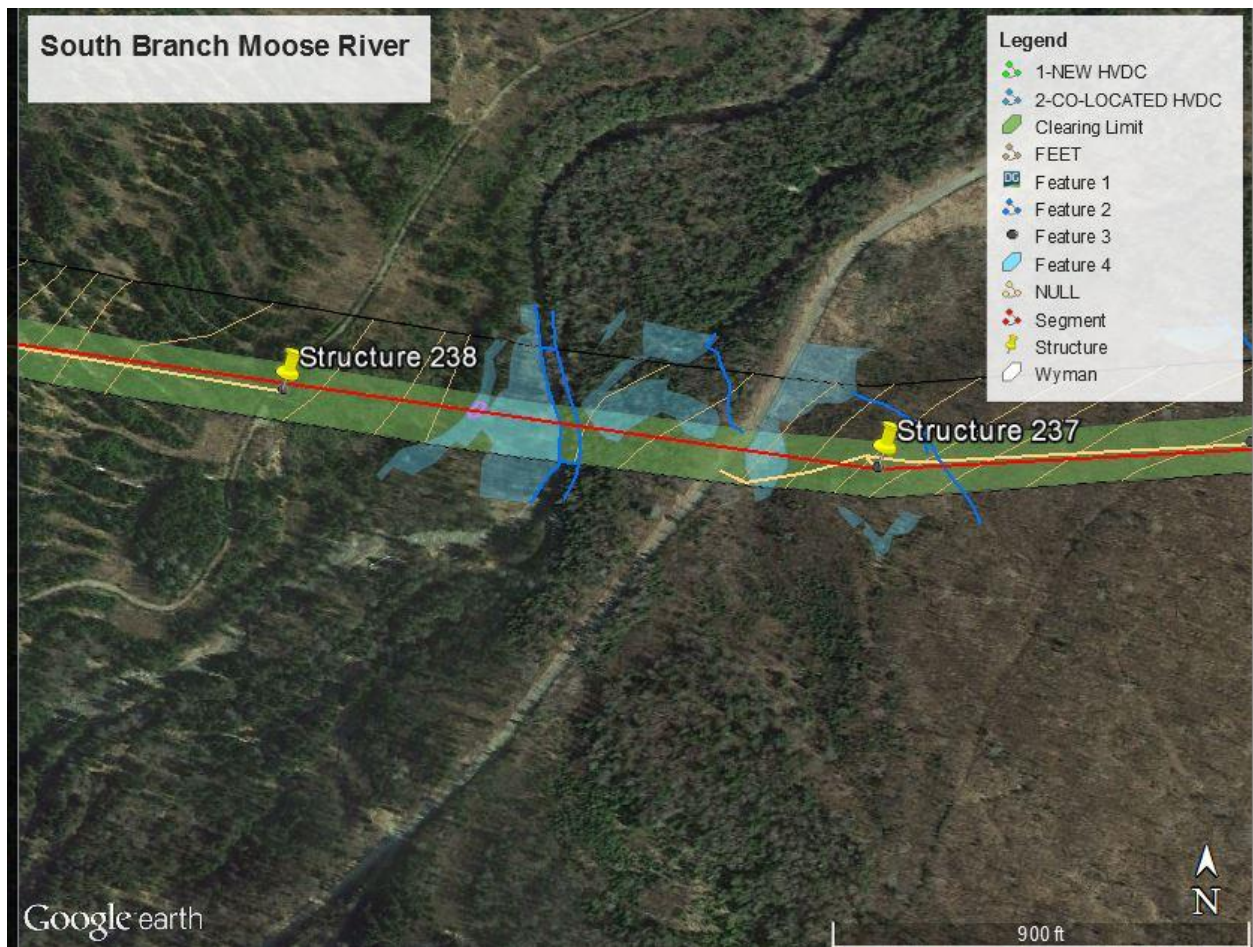


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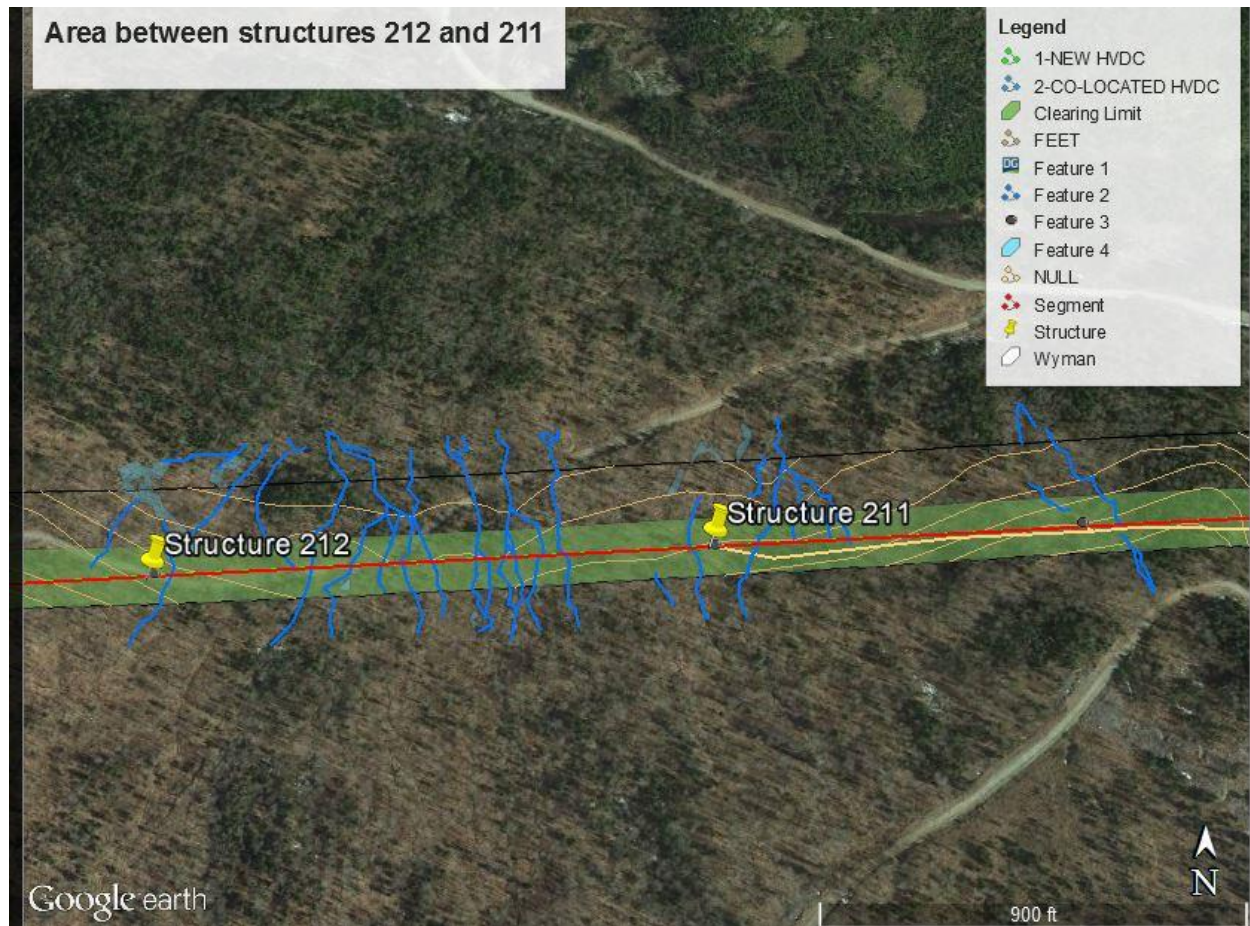
ABB Corporate Research
Västerås, Sweden
dag.ravemark@se.abb.com

Bo Normark

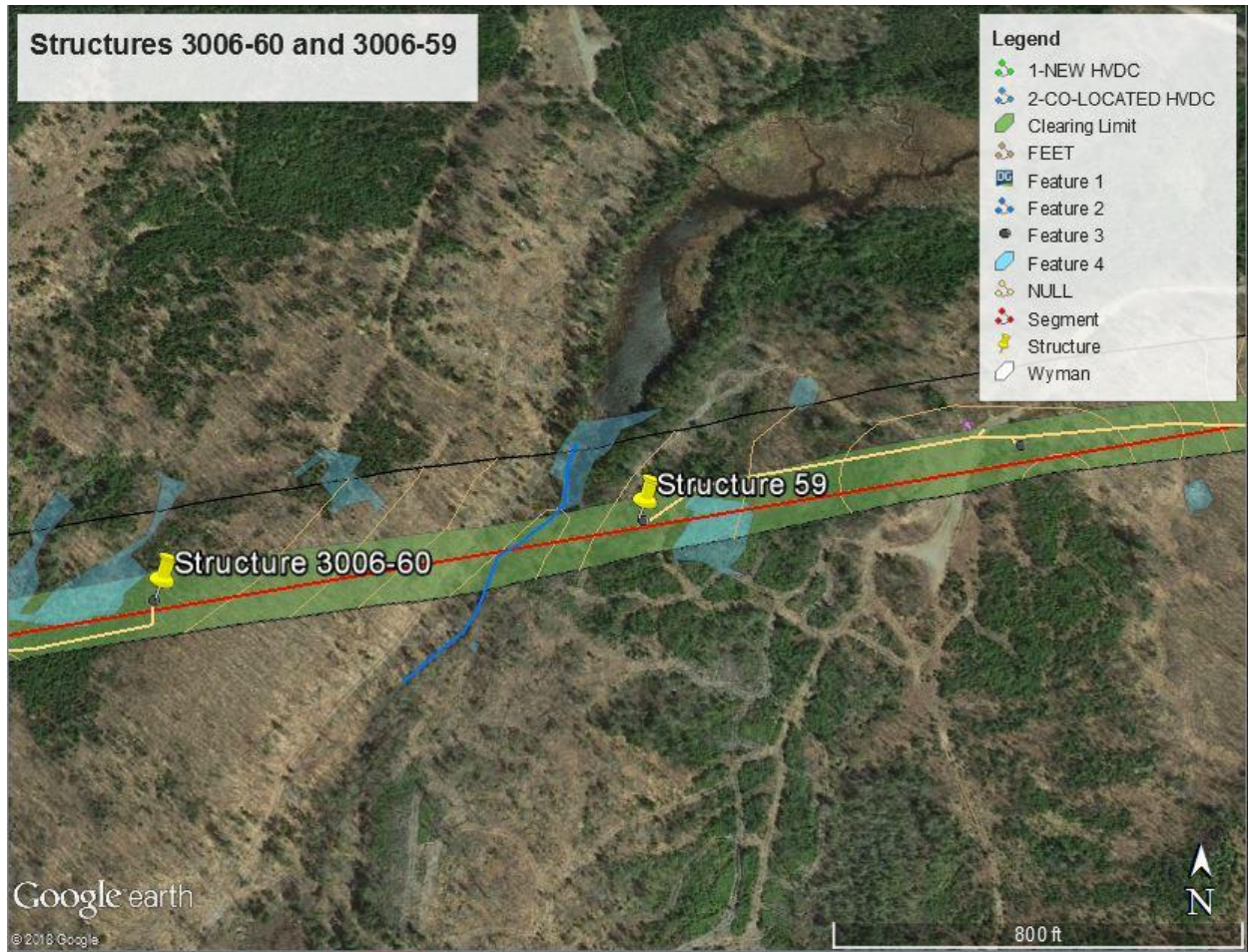
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Zürich, Switzerland



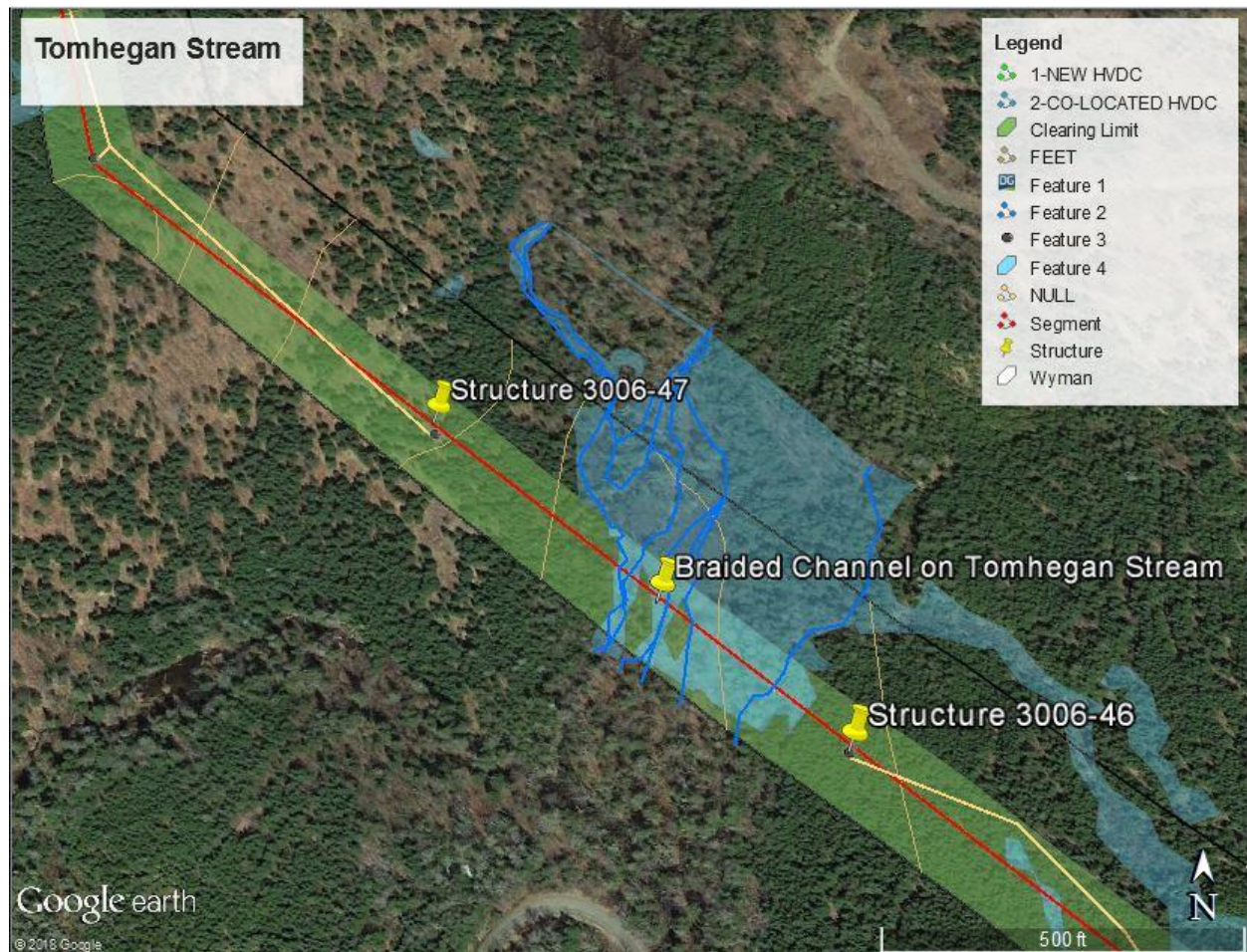
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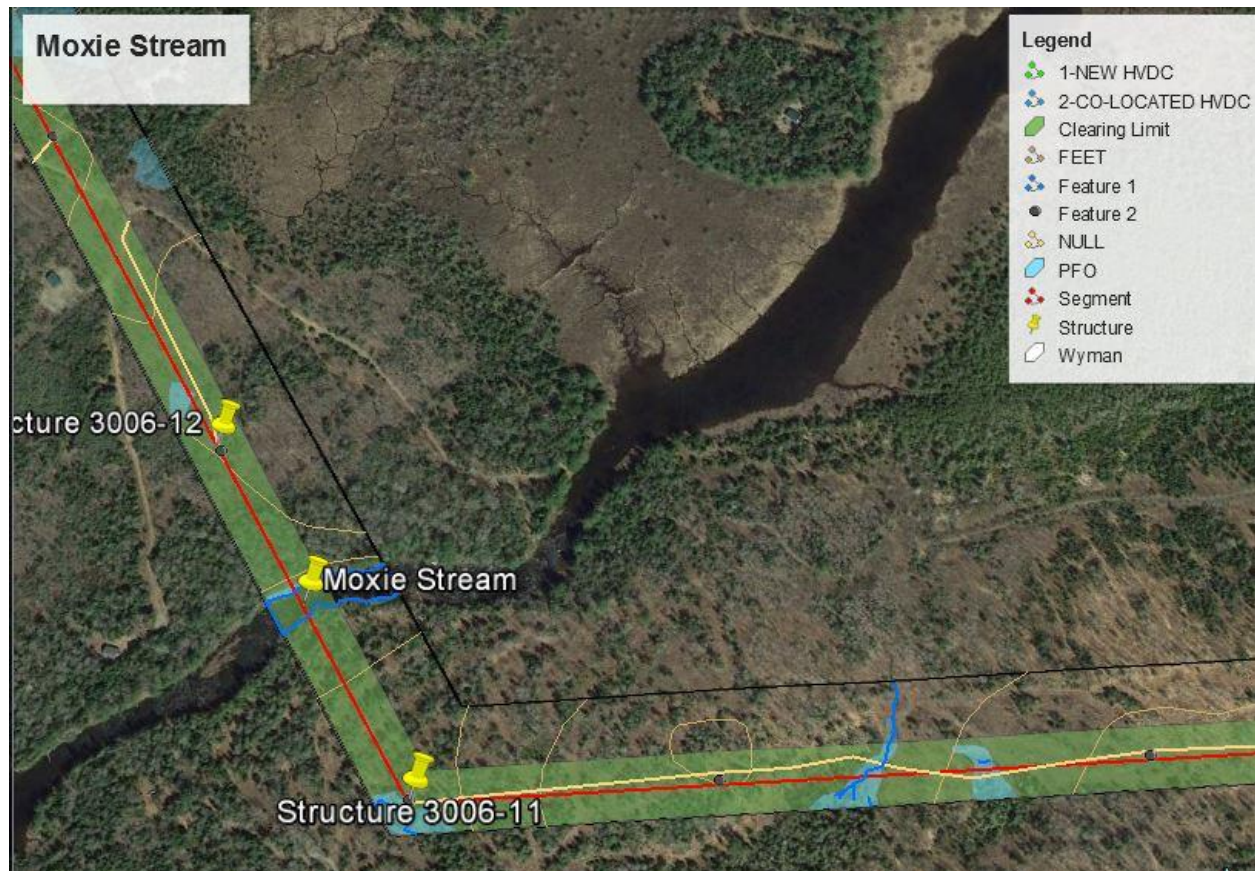
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**MATTHEW D. MANAHAN**

Merrill's Wharf
254 Commercial Street
Portland, ME 04101

P 207.791.1189
F 207.791.1350
C 207.807.4653
mmanahan@pierceatwood.com
pierceatwood.com

Admitted in: MA, ME, NH

February 28, 2019

James R. Beyer
Maine Dept. of Environmental Protection
106 Hogan Road, Suite 6
Bangor, ME 04401

Bill Hinkel
Land Use Planning Commission
22 State House Station
Augusta, ME 04333-0022

RE: NECEC – Pre-Filed Direct Testimony

Dear Jim and Bill:

Enclosed is CMP's Pre-filed Direct Testimony. Pursuant to the Third Procedural Orders, we are sending, via overnight delivery, the following:

- Original and 4 copies of CMP's Pre-Filed Direct Testimony for the DEP;
- Original and 9 copies of CMP's Pre-Filed Direct Testimony for LUPC.

Thank you.

Sincerely,

A handwritten signature in black ink, appearing to read "M. Manahan", written over a horizontal line.

Matthew D. Manahan

Enclosure

cc: Service Lists (via email)

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY)
NEW ENGLAND CLEAN ENERGY CONNECT)
#L-27625-26-A-N/#L-27625-TG-B-N/)
#L-27625-2C-C-N/#L-27625-VP-D-N/)
#L-27625-IW-E-N)
)
CENTRAL MAINE POWER COMPANY)
NEW ENGLAND CLEAN ENERGY CONNECT)
SITE LAW CERTIFICATION SLC-9)
Beattie Twp, Merrill Strip Twp, Lowelltown Twp,)
Skinner Twp, Appleton Twp, T5 R7 BKP WKR,)
Hobbs town Twp, Bradstreet Twp,)
Parlin Pond Twp, Johnson Mountain Twp,)
West Forks Plt, Moxie Gore,)
The Forks Plt, Bald Mountain Twp, Concord Twp)

PRE-FILED DIRECT TESTIMONY
of

CENTRAL MAINE POWER COMPANY

FEBRUARY 28, 2019

**EXHIBIT LIST FOR PRE-FILED DIRECT TESTIMONY
OF CENTRAL MAINE POWER COMPANY**

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Beattie Pond Map.....	CMP-8-H
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AT Crossing Figure.....	CMP-8-J

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY)
NEW ENGLAND CLEAN ENERGY CONNECT)
#L-27625-26-A-N/#L-27625-TG-B-N/)
#L-27625-2C-C-N/#L-27625-VP-D-N/)
#L-27625-IW-E-N)

CENTRAL MAINE POWER COMPANY)
NEW ENGLAND CLEAN ENERGY CONNECT)
SITE LAW CERTIFICATION SLC-9)
Beattie Twp, Merrill Strip Twp, Lowelltown Twp,)
Skinner Twp, Appleton Twp, T5 R7 BKP WKR,)
Hobbs town Twp, Bradstreet Twp,)
Parlin Pond Twp, Johnson Mountain Twp,)
West Forks Plt, Moxie Gore,)
The Forks Plt, Bald Mountain Twp, Concord Twp)

PRE-FILED DIRECT TESTIMONY AND EXHIBITS OF
THORN DICKINSON

Regarding

- Project Overview

February 28, 2019

I. Qualifications of Witness (Relevant to DEP and LUPC Review)

I am Vice President - Business Development for Avangrid Networks. In this role I am responsible for creating and leading Avangrid's business development and growth initiatives. I have worked in the utility industry for thirty years in various roles including transmission and

distribution operations, resource planning, rates and regulatory, strategic planning, investor relations and risk management. I have worked on integrated resource planning, clean air compliance, industry restructuring, and mergers and acquisitions.

My CV is attached hereto as Exhibit CMP-1-A.

II. Purpose and Scope of Testimony (Relevant to DEP and LUPC Review)

The purpose of my testimony is to provide an overview to the Maine Department of Environmental Protection (DEP) and to the Maine Land Use Planning Commission (LUPC) of the New England Clean Energy Connect Project (NECEC Project, NECEC, or Project), which will be developed, constructed, and operated by Central Maine Power Company (CMP).

Attached hereto as Exhibit CMP-1-B is a Project Overview PowerPoint.

III. Discussion (Relevant to DEP and LUPC Review)

a. Project Description (Relevant to DEP and LUPC Review)

The NECEC Project is a high voltage direct current (HVDC) transmission line and related facilities which will be capable of delivering up to 1,200 megawatts of renewably generated (i.e., reservoir hydropower) electricity from the Canadian border to the ISO-New England (ISO-NE) electric grid. CMP proposed the Project in response to the March 31, 2017 Request for Proposals for Long-Term Contracts for Clean Energy Projects (RFP) issued by the Massachusetts Department of Energy Resources and the Electric Distribution Companies of Massachusetts. Since CMP filed its initial applications with the DEP and LUPC in September 2017, the Project has been selected as the winning bidder in the RFP solicitation and the associated NECEC long-term agreements have been signed and submitted for regulatory approval.

CMP is the developer of the Maine transmission portion of the Project, which is comprised of the Project components described in the Direct Testimony of CMP witness Gerry Mirabile. A map depicting the Project in relation to CMP's existing system is attached hereto as Exhibit CMP-1-C. The majority of the Project will be constructed adjacent to existing transmission lines in existing transmission corridors owned by CMP, with the remainder constructed on commercial forestland owned or controlled by CMP. A Project Overview Map is attached hereto as Exhibit CMP-1-D. A Project Segment Overview Map is attached hereto as Exhibit CMP-1-E. The Project is on schedule to achieve its December 13, 2022 commercial operation date.

b. Project Purpose and Need (Relevant to DEP and LUPC Review)

The purpose of the NECEC Project is to deliver up to 1,200 MW of renewably-generated electricity from Québec, Canada to the ISO-NE electric grid, also known as the New England Control Area. The Project is routed on private land that CMP already owns or controls, including existing transmission corridors. This route is shorter than other routes for deliveries from Québec to New England and represents the lowest-cost path for the delivery of Clean Energy Generation¹ from Québec.

The NECEC Project responds to Massachusetts' RFP seeking 9,450,000 MWh of Clean Energy Generation to be procured through cost-effective long-term contracts. The Project's selection under the RFP demonstrates that Massachusetts has concluded that the NECEC will meet this need. Furthermore, the clean energy delivered by the Project will provide firm, guaranteed, and tracked year-round energy deliveries that will reduce winter electricity price

¹ Under the terms of the RFP, "Clean Energy Generation" means either: (i) firm service hydroelectric generation from hydroelectric generation alone; (ii) new Massachusetts Class I RPS eligible resources that are firm up with firm service hydroelectric generation; or (iii) new Massachusetts Class I RPS eligible resources.

spikes, improve system reliability and resiliency, and provide renewable energy certificates [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

IV. Conclusion (Relevant to DEP and LUPC Review)

The NECEC Project was developed to ensure that it will not adversely impact the scenic beauty and unsurpassed environmental value of the area the Project crosses. It serves a crucial purpose and need.

Exhibits:

CMP-1-A: Thorn Dickinson CV

CMP-1-B: Project Overview PowerPoint

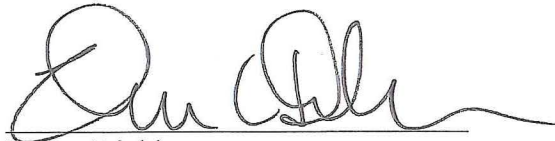
CMP-1-C: CMP System Map (Figure 1 from PUC Application)

CMP-1-D: Project Overview Map

CMP-1-E: Project Segment Overview Map

Dated: 2/27/19

Respectfully submitted,



Thorn Dickinson

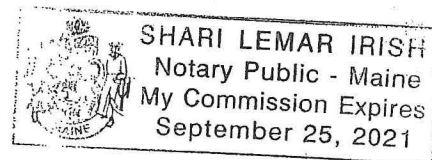
STATE OF MAINE
Cumberland, ss.

The above-named Thorn Dickinson did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Before,

Dated: 2/27/19


Notary Public
Name:
My Commission Expires:



Thorn C. Dickinson

Work History

Avangrid Networks (f/k/a Iberdrola USA), Portland, ME

2011-present

Vice President – Business Development

- Responsible for creating and supporting business development and growth initiatives for Iberdrola USA. Growth initiatives include both green field development and mergers and acquisitions.
- M&A transactions included Connecticut Natural Gas, Southern Connecticut Gas, Berkshire Gas, Hartford Steam, NYSEG Solutions, Energetix, and New Hampshire Gas.

2002-2011

Director Risk Management

- Assess and address the causes and effects of uncertainty and risk throughout the organization.
- Apply a variety of financial and statistical analysis and modeling approaches to accurately assess and make decisions about risk.
- Acquire adequate and cost-effective risk financing for property, casualty, professional and environmental exposures for the company and its subsidiaries and oversee the claims management process.
- Identify the company's critical processes and ensure that there are tested contingency plans in place to restore those processes in case of a disaster.

1997-2002

Manager – Investor Relations

- Effectively communicate corporate strategy, financial results and expected performance to the investment community.
- Provide management information on financial markets, investor perspectives and peer performance.
- Develop, coordinate and present information to the investment community.

1997-2003

Manager of Rates and Revenue Requirements

- Responsible for state revenue requirement issues.
- Responsible for rate design development.

New York State Electric & Gas Corp., Binghamton, NY

1994-1997

Coordinator – Cost Support & Pricing

- Responsible for cost studies that support pricing strategies, profitability analysis, and regulatory compliance.
- Responsible for the testimony related to cost analysis in state and federal proceedings.
- Led a cross-functional team charged with the development and application of models for the purposes of evaluating the risks and opportunities of a restructured competitive environment.

Thorn C. Dickinson
Page 2

1991-1994

Staff Engineer – Planning & Procurement

- Performed financial analysis on supply and demand resources. One example of this analysis includes the analysis of how the corporation should comply with the Clean Air Act.
- Negotiated power purchase contracts with Non-Utility Generation. Kept these projects under control and moving forward from the initial contact with the developer through the contractual, engineering, construction, testing, commercial operation, and closeout phases of the project.

1988-1991

Field Engineer

- Managed a group responsible for the construction, operation, and maintenance of power delivery systems.
- Developed construction schedules, budgets, and determined manpower requirements for capital projects.
- Responded to customer concerns regarding voltage problems, system reliability, and equipment failure.
- Met with customers, other utilities, state, and county officials to coordinate work and to obtain permit approvals and easements.

Education

B.S. in Electrical Engineering

Union College, Schenectady, NY

Master in Business Administration

Syracuse University, Syracuse, NY



NEW ENGLAND
**CLEAN ENERGY
CONNECT**

New England Clean Energy Connect Project Overview

Thorn Dickinson
Exhibit CMP-1-B

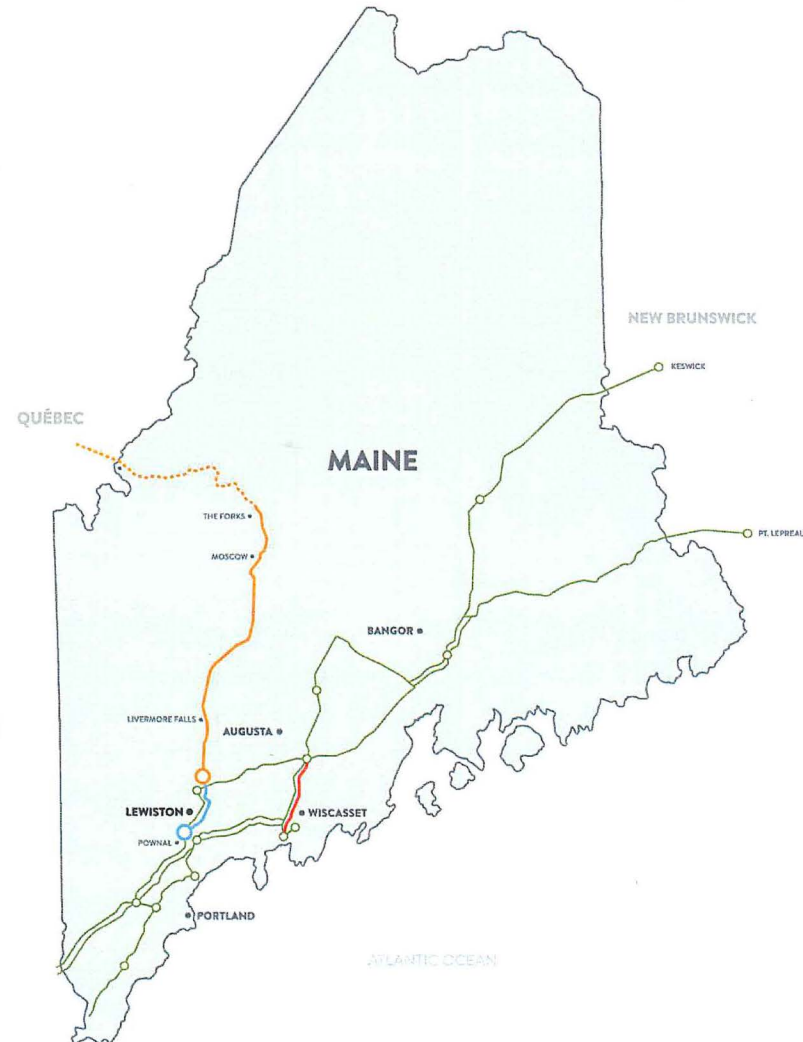
Project Purpose and Need

- High voltage direct current (HVDC) transmission line and related facilities
- Delivering 1,200 megawatts of renewably generated electricity from Québec to the ISO-NE electric grid
- Proposed in response to the March 31, 2017 Request for Proposals (RFP) for Long-Term Contracts for Clean Energy Projects issued by the Massachusetts Department of Energy Resources and the Electric Distribution Companies of Massachusetts

- [REDACTED]
 - [REDACTED]
 - [REDACTED]
 - [REDACTED]
 - [REDACTED]
 - [REDACTED]

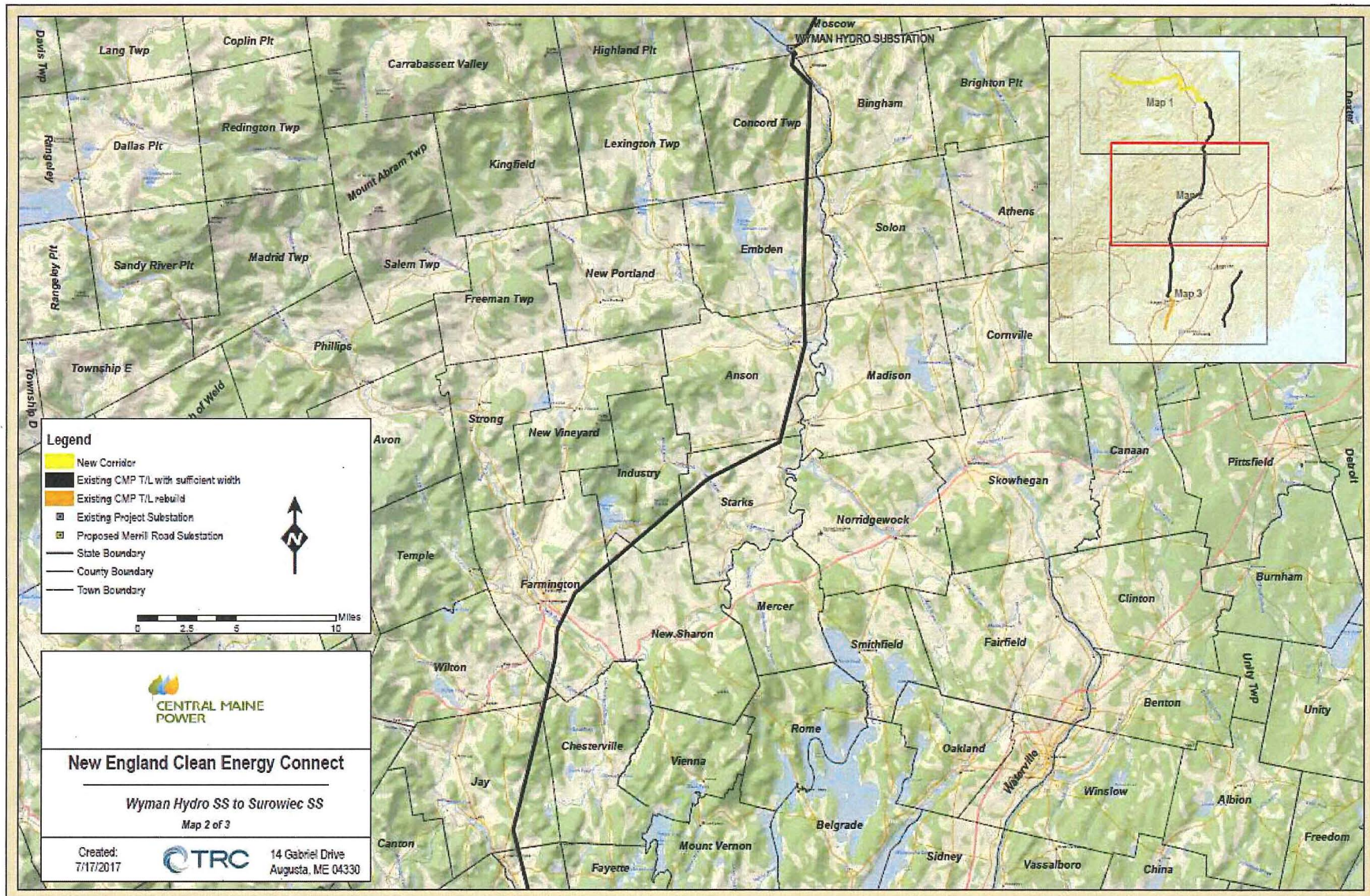
Project Overview

- 193 miles of transmission line corridor from Québec to Lewiston and from Windsor to Wiscasset
- Substation Upgrades: Cumberland, Lewiston, Pownal, Windsor, Wiscasset
- \$950 million development
- Full control/ownership of route
- 139.5 miles of the route is within existing corridors
- Fully operational by end of 2022



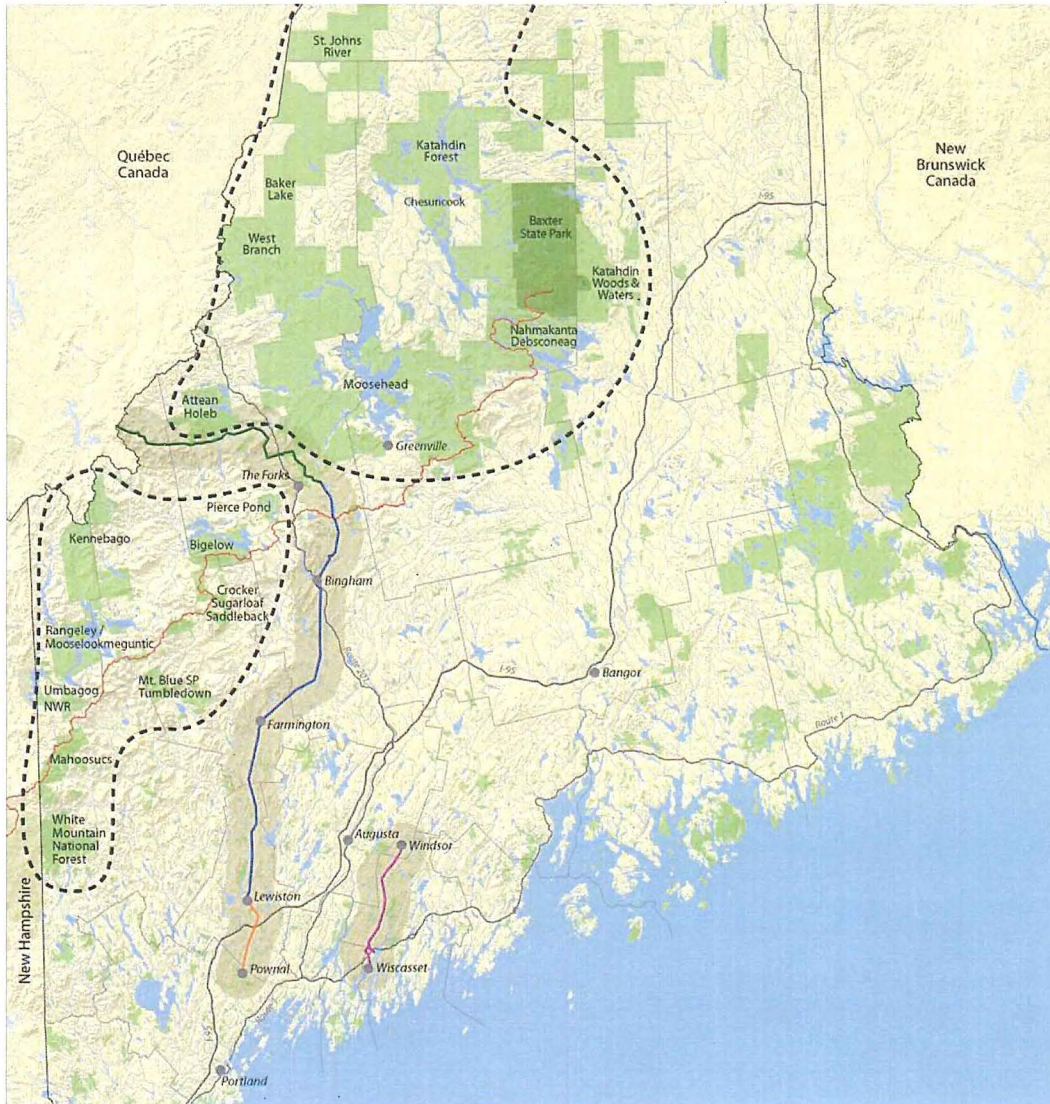


Project Overview





Siting the NECEC



Minimize impact to the environment:

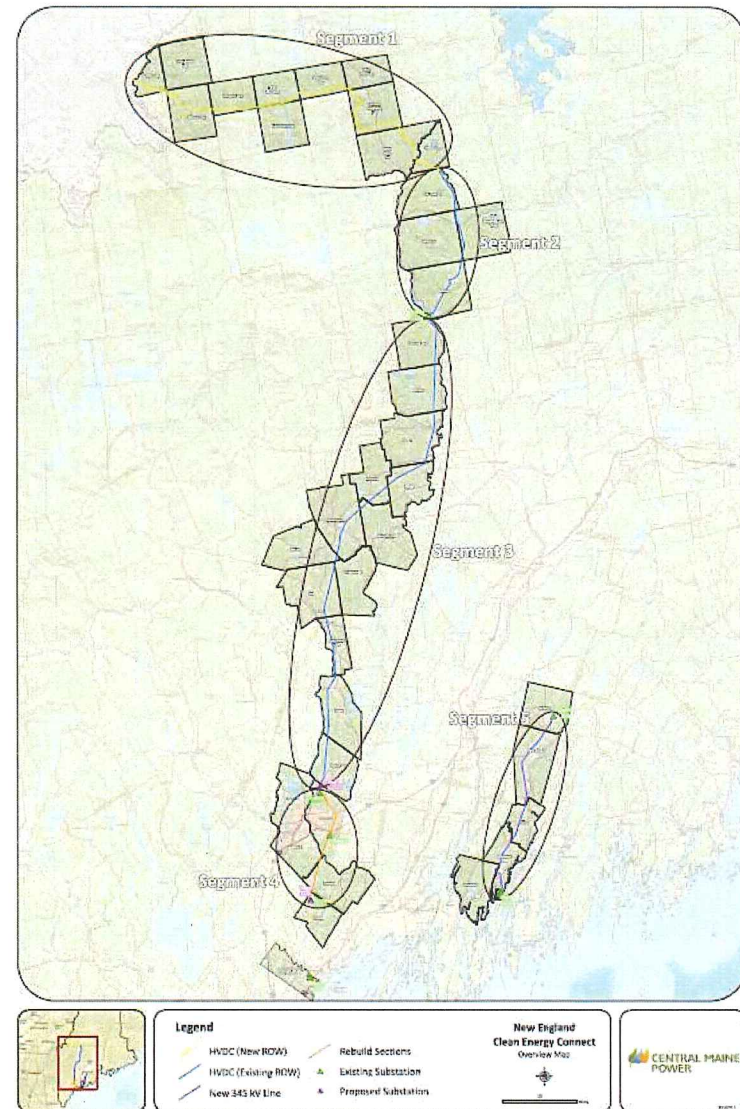
- **72%** of route in existing corridor
- **28%** in new corridor through privately-owned working forest
- **0.01%** wetlands displaced (0.15 acres out of 2,209 acres)

Leverage existing substations:

- Larrabee Road, Lewiston
- Coopers Mills Road, Windsor
- Maine Yankee, Wiscasset

NECEC Permits and Timeline

- State Approvals
 - Maine PUC CPCN
 - Maine DEP Site Law/NRPA Permit
 - Maine LUPC Certification
 - Massachusetts DPU Approvals
- Regional Approvals
 - ISO-NE Approval
- Federal Approvals
 - USACE Permit
 - US DOE Presidential Permit
 - FERC Approval
- Municipal Approvals
- **Expected Project Completion Date:
December 31, 2022**

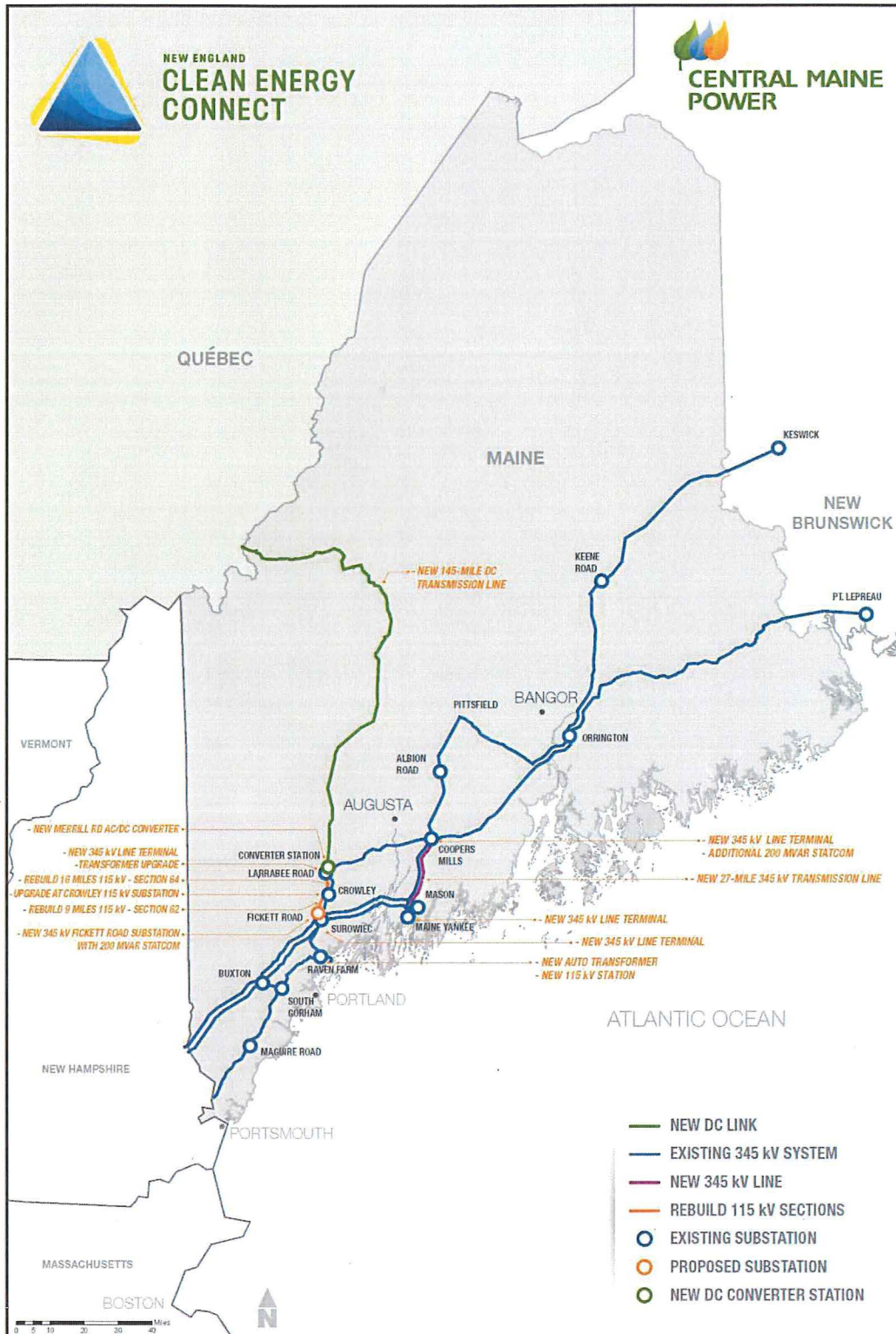


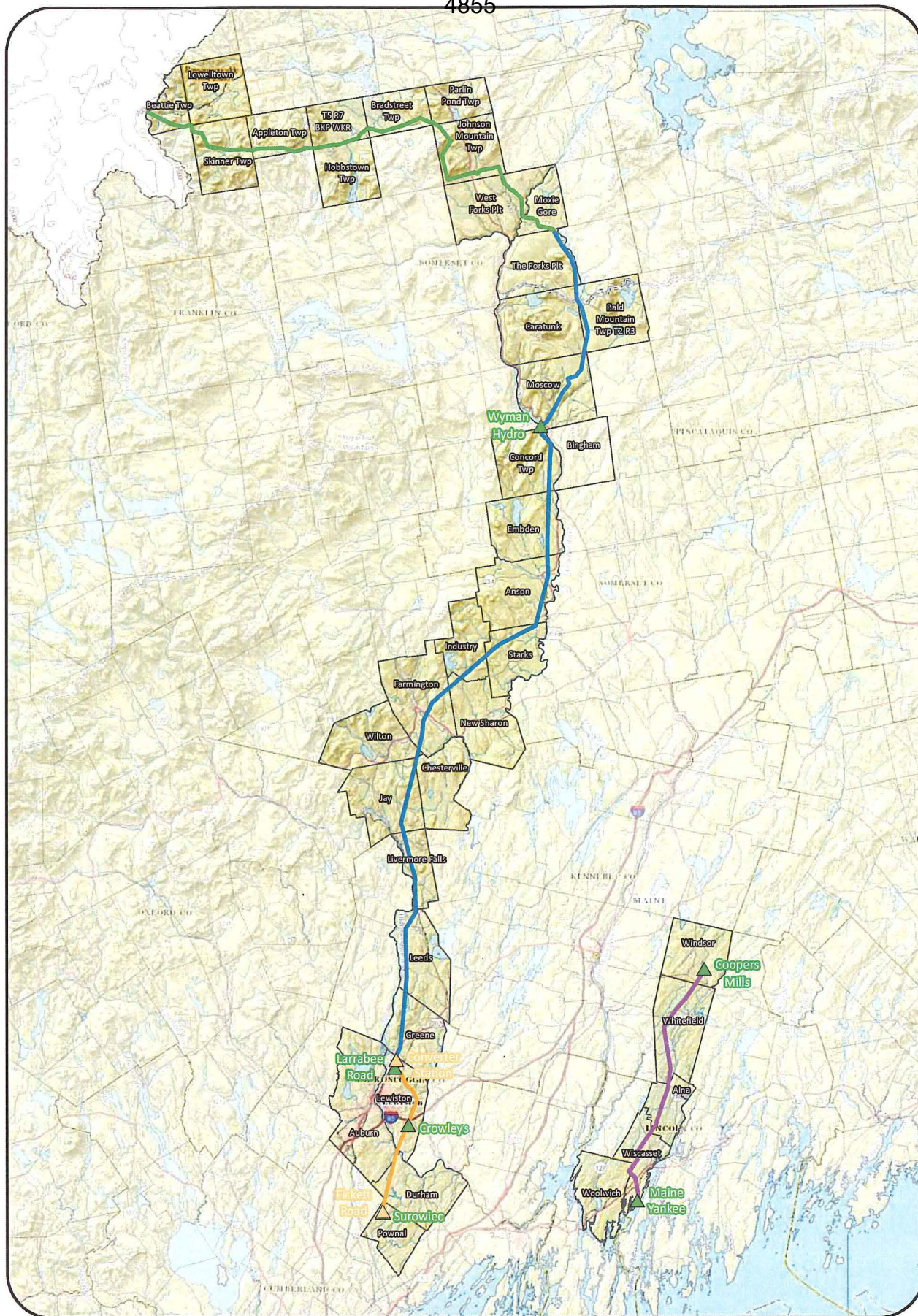
NECEC

Questions?

1

Figure 1 - Map of the NECEC

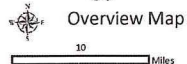


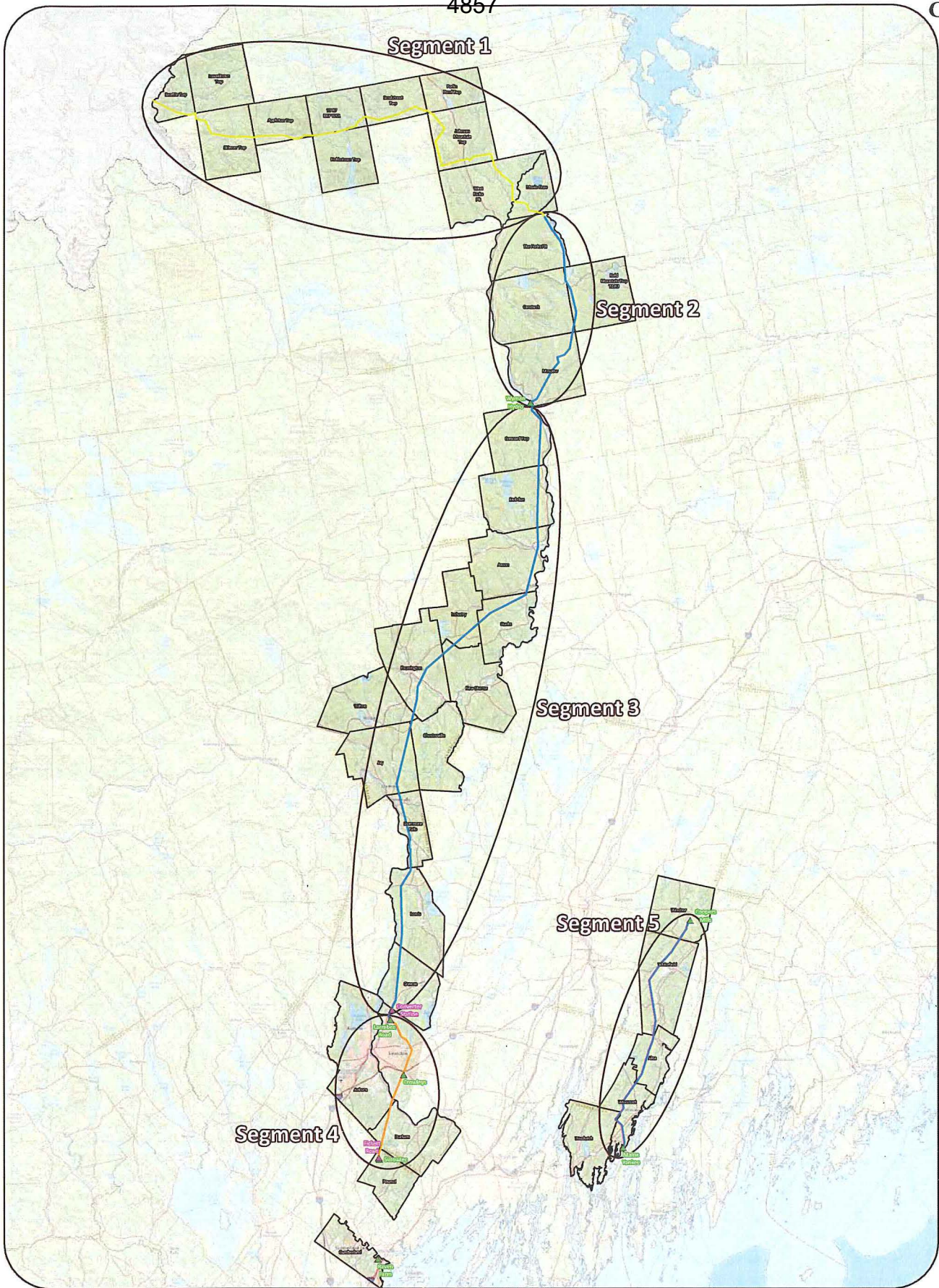


Legend

- Direct Current Transmission Line (new ROW)
- Direct Current Transmission Line (existing ROW)
- New 345 kV Line
- Rebuild Sections
- ▲ Existing Substation
- ▲ Proposed Substation

New England Clean Energy Connect





Legend

- HVDC (New ROW)
- HVDC (Existing ROW)
- New 345 kV Line
- Rebuild Sections
- ▲ Existing Substation
- ▲ Proposed Substation

**New England
Clean Energy Connect
Overview Map**



10 Miles



STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY)
NEW ENGLAND CLEAN ENERGY CONNECT)
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#L-27625-IW-E-N)

CENTRAL MAINE POWER COMPANY)
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Hobbs town Twp, Bradstreet Twp,)
Parlin Pond Twp, Johnson Mountain Twp,)
West Forks Plt, Moxie Gore,)
The Forks Plt, Bald Mountain Twp, Concord Twp)

PRE-FILED DIRECT TESTIMONY AND EXHIBITS OF
GERRY J. MIRABILE

Regarding

- Project Overview
- Issue 1: Scenic Character and Existing Uses
- Issue 2: Wildlife Habitat and Fisheries
- Issue 3: Alternatives Analysis
- Issue 4: Compensation and Mitigation

February 28, 2019

I. Qualifications of Witness (Relevant to DEP and LUPC Review)

My name is Gerry J. Mirabile. I am employed by Central Maine Power Company (CMP) as Manager – NECEC Permitting. I am responsible for the accurate identification and procurement of all necessary federal, state, and municipal environmental and land use permits, licenses, and approvals for the New England Clean Energy Connect (NECEC) Project.

I have been employed at CMP since 1989. Since approximately 2000 I have been solely responsible for managing permitting of CMP capital projects (such as transmission lines, substations, service centers, and submerged cables). I have also been responsible for numerous environmental compliance programs at CMP including Clean Air Act compliance, oil and chemical release reporting, federal Spill Prevention, Control and Countermeasure (or SPCC) compliance, greenhouse gas emissions reporting, environmental best practices and procedures development, and training.

Prior to my employment at CMP I worked for four years at the Maine Department of Environmental Protection (DEP), administering land use and wastewater discharge statutes and regulations, evaluating the environmental impacts of permit proposals, drafting DEP orders, and educating applicants and the public on Maine environmental standards and best practices.

I earned a Bachelor of Science in Ecology degree from Johnson State College in Vermont in 1984, and was awarded the Award for Excellence in Ecology. I earned a Master of Science in Business degree from Husson College in 2000, and a Master of Business Administration degree from Husson University in 2013. My curriculum vitae is attached hereto as Exhibit CMP-2-A.

II. Purpose and Scope of Testimony (Relevant to DEP and LUPC Review)

The purpose and scope of my testimony are as follows: to provide an overview of the NECEC Project; to describe its impact on scenic character and existing uses; to describe its

impact on wildlife habitat and fisheries; to describe the process and criteria by which alternatives to the NECEC Project and route were evaluated; and to describe the basis for the NECEC compensation and mitigation proposals.

III. Summary of Testimony (Relevant to DEP and LUPC Review)

I am providing testimony on the following topics:

- Project overview: description of the NECEC Project scope and overview of Project components.
- Scenic Character and Existing Uses: overview of Project provisions for minimizing visual impacts to surrounding areas including buffering.
- Wildlife Habitat and Fisheries: description of Project impacts on certain fisheries and wildlife habitat, certain endangered species, coldwater fisheries, and habitat fragmentation.
- Alternatives Analysis: description of the alternatives to the proposed NECEC Project route, how alternative routes were evaluated, and why the preferred route was selected.
- Compensation and Mitigation: description of measures to avoid, minimize, mitigate, and compensate for unavoidable NECEC Project impacts.

IV. Discussion

a. Project Overview

i. Project Description (Relevant to DEP and LUPC Review)

The NECEC Project is a high voltage direct current (HVDC) transmission line and related facilities that will be capable of delivering up to 1,200 megawatts of renewably generated electricity from the Canadian border to the ISO-NE electric grid. The Project was proposed in response to the Request for Proposals for Long-Term Contracts for Clean Energy Projects (RFP)

dated March 31, 2017 and issued by the Massachusetts Department of Energy Resources and the Electric Distribution Companies of Massachusetts.

NECEC Project components include the following:

Project Segments 1, 2, & 3

- 145.3 miles of new +/-320kV HVDC transmission line from the Canadian border to a new DC to AC converter substation north of Merrill Road in Lewiston, including crossing beneath the upper Kennebec River via horizontal directional drilling;
- 1.2 miles of new 345kV transmission line from the new Merrill Road Converter Station to the existing Larrabee Road Substation in Lewiston;
- Partial rebuild of 0.8 mile of 34.5kV transmission line Section 72 outside of the Larrabee Road Substation to make room in the corridor for the above 1.2-mile 345kV transmission line;
- New +/- 320kV DC to 345kV AC 1,200MW converter station north of Merrill Road in Lewiston; and
- Addition of 345kV transmission line terminal at the existing Larrabee Road Substation in Lewiston.

Project Segment 4

- New 345kV +/-200MVAR STATCOM (a voltage support device) at new Fickett Road Substation in Pownal;
- New 0.3-mile 345kV AC transmission line from the existing Surowiec Substation in Pownal to the new Fickett Road Substation in Pownal;
- Rebuild of 16.1 miles of 115kV Section 64 AC transmission line from the existing Larrabee Road Substation in Lewiston to the existing Surowiec Substation in Pownal; and
- Rebuild of 9.3 miles of 115kV Section 62 AC transmission line from the existing Crowley Road Substation in Lewiston to the existing Surowiec Substation in Pownal.

Segment 5

- New 26.5-mile 345kV AC transmission line from the existing Coopers Mills Substation in Windsor to the existing Maine Yankee Substation in Wiscasset;
- Partial rebuild of 0.3 mile of 345kV Section 3025 transmission line between Larrabee Road Substation in Lewiston and Coopers Mills Substation in Windsor;
- Partial rebuild of 0.8 mile of 345kV Section 392 transmission line between Maine Yankee Substation in Wiscasset and Coopers Mills Substation in Windsor; and
- Partial rebuild of 0.8 mile each of 115kV Sections 60 and 88 outside of Coopers Mills Substation in Windsor.

Other Components

- Additional equipment will be installed, and additional upgrades will be made, at Larrabee Road Substation in Lewiston, Crowley's Substation in Lewiston, Surowiec Substation in Pownal, Raven Farm Substation in Cumberland, Coopers Mills Substation in Windsor, and Maine Yankee Substation in Wiscasset.

Exhibit CMP-2-B is an Overview Map, which divides the Project into the above-referenced segments. Exhibit CMP-2-C is an Overview Map, which designates which portions of the Project are in LUPC territory. Exhibit CMP-2-D is a Project Recreation Areas Map, which shows the siting of the Project to avoid natural and recreational resources and to locate as much of the route as possible within existing utility corridors.

ii. Project Purpose and Need (Relevant to DEP and LUPC Review)

The purpose of the NECEC Project is to deliver renewable energy from Canada to New England, which has a continuing need for such power. The Project will deliver up to 1,200 MW of renewably-generated electricity from Québec, Canada to the ISO-NE electric grid, also known as the New England Control Area. This clean energy will provide firm, guaranteed, and tracked year-round energy deliveries that will reduce winter electricity price spikes, reduce the wholesale cost of electricity for the benefit of retail customers across the region, improve system reliability and resiliency, and provide renewable energy certificates and other environmental attributes to help Massachusetts meet its renewable energy goals.

b. Issue 1 (Scenic Character and Existing Uses)

i. Buffering for Visual Impacts (Relevant to DEP and LUPC Review)

CMP sited the NECEC Project to maximize the use of natural buffers such as topography and intervening vegetation, to minimize the visibility of the Project. Examples of this include:

- Proposing to cross beneath the upper Kennebec River, an Outstanding River Segment identified in Maine statute, utilizing horizontal directional drilling (HDD) rather than an overhead crossing, to eliminate visible conductors and structures from the Kennebec River and to maintain this river segment's scenic and recreational values;
- Orienting the transmission line perpendicular to Route 201 where the corridor crosses this road, a Scenic Byway, so that the transmission line corridor is visible for the minimum amount of time to passing motorists;
- Locating the transmission line corridor along the west side of Johnson Mountain and along the shoulder of Coburn Mountain to reduce its visibility from Route 201; and

- At the request of the LUPC, proposing to shorten a structure close to Beattie Pond, a Management Class 6 remote pond in Beattie Township, to minimize its visual impact and visibility to recreational users of this pond.

CMP proposed to create and maintain buffer strips to minimize Project visual impacts, protect and maintain water quality, and facilitate movement of wildlife within and between important habitat. Examples of this include:

- Roadside buffer plantings of compatible species have been proposed in the following areas, to reduce its visibility in these areas:
 - Along both sides of Troutdale Road where the Appalachian Trail (AT) is in close proximity to the Project; and
 - Where the NECEC transmission line corridor crosses Route 201 in Moscow and in Johnson Mountain Township.
- Tapering of vegetation along the edges of transmission line corridor segments visible from the summit of Coburn Mountain in Upper Enchanted Township and from Rock Pond looking toward Three Slide Mountain in T5R6 BKP WKR and Appleton Township, to minimize the visual impact of the Project from these viewpoints.
- Proposing riparian (stream) buffers of 100 feet adjacent to all perennial streams within Project Segment 1; adjacent to all coldwater fishery streams crossed by the Project; adjacent to all streams containing threatened or endangered species; and adjacent to all four Outstanding River Segments crossed aurally by the Project (Kennebec River below Wyman Dam, Carrabassett River, Sandy River, West Branch of the Sheepscot River); within these buffers stringent vegetation clearing and management restrictions, as well as herbicide application restrictions, apply.
- At the request of the DEP and the Maine Department of Inland Fisheries and Wildlife (DIFW), expanded riparian buffers of 75 feet for all other streams.
- Within the upper Kennebec River biological deer wintering area, establish and maintain 10 deer winter travel corridors totaling approximately 1.1 linear miles. In these corridors, vegetation will be maintained either at full mature height (two segments for a distance of 2,610 feet) or at heights up to 35 feet (8 segments for a distance of 3,279 feet).

CMP buffered the NECEC Project to minimize adverse visual impacts to the maximum extent practicable by a number of means, including:

- Siting the NECEC Project route specifically to avoid proximity to and visibility from recreational areas such as state parks, wildlife preserves, and other conserved lands including: White Mountain National Forest; Mahoosuc Public Preserve; Umbagog National Wildlife Refuge; Richardson Lakes; Rangeley Lake; Kennebag Lake; Saddleback Mountain; Sugarloaf Mountain; Appalachian Trail; Bigelow Preserve;

Flagstaff Lake; Spencer Lake; Kennebec River Gorge; Moosehead Lake; and Baxter State Park/Mount Katahdin.

- To the extent possible while avoiding the above sensitive areas, choosing the straightest route between Beattie Township (where the Hydro Quebec Transenergie transmission line meets the U.S./Canada border) to the existing CMP transmission line Section 222 corridor, thus minimizing and limiting the length of new transmission line corridor to 53.5 miles.
- Co-locating more than 70% of the proposed NECEC transmission line with existing transmission lines within existing corridors, avoiding or minimizing new visual impacts that can occur with new corridors, and taking advantage of existing compatible land uses.
- CMP's proposal, in October 2018, to avoid an aerial crossing of the upper Kennebec River, and instead to cross beneath the river using HDD, preventing the stringing of conductors, shield wires, and associated aviation markers across a segment of the Kennebec River that is an Outstanding River Segment. As an Outstanding River Segment, this stretch of the Kennebec River is recognized for its "unparalleled natural and recreational values" and for providing "irreplaceable social and economic benefits to the people in their existing state." The upper Kennebec is highly valued by rafters, other boaters, and other recreationists; CMP's HDD proposal protects these values and uses.
- Use of self-weathering steel structures in most locations to support transmission line conductors (wires). This material's brown/oxidized color and dull finish are more alike visually to surrounding trees and vegetation than typical galvanized steel structures, and are therefore less obtrusive and more compatible with their natural surroundings.
- Structures proposed along the west side of Moxie Lake, to be co-located within an existing corridor adjacent to an existing transmission line, were reduced in height after their initial design to minimize their visibility.
- Maximizing the use of natural buffers such as topography and intervening vegetation, to minimize the visibility of the Project by, for example, avoiding ridgelines and siting the transmission corridor along side slopes and low points.

ii. Buffering Specific to the P-RR Subdistrict (Relevant to LUPC Review)

As noted earlier, at the request of the LUPC, CMP has proposed to reduce the height of a proposed transmission line structure close to Beattie Pond, a Management Class 6 remote pond in Beattie Township, to minimize its visual impact and visibility to recreational users of this pond. The transmission line in this area is within the LUPC Recreation Protection subdistrict (P-RR). This redesign, proposed in January 2019, utilizes existing, to be retained vegetation to

block and buffer visibility of this structure from Beattie Pond. Attached as Exhibit CMP-2-E is CMP's January 25, 2019 design modification proposal for this area, including photosimulations.

Regarding the upper Kennebec River P-RR, CMP modified its proposed aerial crossing of the Kennebec River in this area, and on October 19, 2018 proposed to cross beneath the Kennebec River using HDD. This proposal requires two termination stations (i.e., stations where the conductor transitions from aerial to underground), one on each side of the Kennebec River. Termination stations have been sited and designed to be buffered by existing vegetation and topography and therefore invisible to river users. HDD is consistent with the purpose of the P-RR subdistrict in that it buffers and protects this area from Project-related development, and conserves the primitive recreational experience by making both the transmission line and the termination stations invisible to river users. Exhibit CMP-2-F includes photosimulations of the proposed HDD termination stations and vicinity.

Regarding the area where the AT crosses the Project transmission line corridor in three locations, CMP has proposed planted vegetative buffers along the east and west side of Troutdale Road (co-located with the AT in this area) to minimize the Project's visual impact on the AT. These plantings buffer the Project transmission line from the adjacent Appalachian Trail.

iii. Issue 1 Conclusion (Relevant to DEP and LUPC Review)

CMP has made adequate provision for fitting the Project harmoniously into the existing natural environment and the development will not adversely affect scenic character in the municipality or in neighboring municipalities, and the activity will not unreasonably interfere with existing scenic and aesthetic uses. CMP has made adequate provision for buffer strips. The Project design takes into account the scenic character of the surrounding area, the Project has been located, designed, and landscaped to minimize its visual impact to the fullest extent

possible, the Project has been designed and landscaped to minimize its visual impact on the surrounding area, and the Project provides for the preservation of existing elements of the development site which contribute to the maintenance of scenic character.

Where the Project is located within the P-RR subdistrict, it will be sufficiently buffered from other uses and resources to meet the LUPC's special exception criteria.

c. Issue 2 (Wildlife Habitat and Fisheries)

i. Endangered Species – Roaring Brook Mayfly, Spring Salamanders (Relevant to DEP Review)

CMP coordinated closely with DIFW to identify streams containing the endangered Roaring Brook Mayfly and the species of special concern Northern Spring Salamander. Of these streams, DIFW prioritized those whose riparian zones were important to preserve in their natural (forested) condition, and those for which unavoidable impacts would be appropriately compensated by way of a fee.

As a result, CMP proposed, as part of its Compensation Plan, to contribute \$470,000 to the Maine Endangered and Nongame Wildlife Fund. This fee was calculated using the DEP's in-lieu fee formula (not including wetland restoration and enhancement cost).

Also, CMP modified its original Project design to include a total of eight taller structures at Mountain Brook in Johnson Mountain Township and at Three Slide Mountain (adjacent to Gold Brook) in T5R6BKP WKR and Appleton Township to avoid and minimize impacts by allowing full height canopy to be retained within the 250-foot-wide conservation management areas of these water bodies. Accordingly, there will be no unreasonable disturbance or harm to this habitat. A photosimulations of the Project transmission line in the vicinity of Three Slide Mountain is attached as Exhibit CMP-2-G.

CMP's proposal includes the following measures specifically intended to protect wildlife and fisheries, including Roaring Brook Mayfly and Northern Spring Salamanders:

- Riparian (stream) buffers of 100 feet adjacent to all perennial streams within Project Segment 1; adjacent to all coldwater fishery streams crossed by the Project; adjacent to all streams containing threatened or endangered species; and adjacent to all four Outstanding River Segments crossed aurally by the Project. Within these buffers stringent vegetation clearing and management restrictions, as well as herbicide application restrictions, apply.
- At the request of the DEP and DIFW, expanded riparian buffers of 75 feet for all other streams.

Central Maine Power Company has also proposed to conduct instream work, if necessary and if approved by MDEP and USACE, only during the period from July 15 to September 15. In addition, CMP will utilize frozen ground conditions during initial vegetation clearing and project construction to the greatest extent practicable in order to reduce soil compaction, vegetation damage and the need for construction mats.

ii. Brook Trout Habitat (Relevant to DEP Review)

The NECEC Project crosses 223 rivers, streams, or brooks containing brook trout habitat. The most recognized species comprising coldwater fisheries are members of the family Salmonidae (trout and salmon). The most common coldwater species that occur in the Project area is the brook trout (*Salvelinus fontinalis*). While CMP does not agree that brook trout habitat is "significant wildlife habitat," as defined in 38 M.R.S. § 480-B(10), to minimize unavoidable impacts to brook trout habitat, CMP proposed widened riparian buffers of 100 feet for all coldwater fishery streams (as determined by DIFW), which include brook trout habitat. Within these buffers:

- Foliar herbicides will not be applied;
- Vehicle refueling or maintenance will not be done (unless on an existing paved road or if using secondary containment under the supervision of an environmental inspector);

- Stream crossings will be accomplished through the use of equipment spans with no in-stream disturbance;
- Initial tree clearing will be performed during frozen ground conditions whenever possible;
- Mechanized equipment will be allowed only if supported by construction matting (unless during frozen ground conditions);
- Travel lanes or reach-in techniques will be used to the greatest extent possible;
- Outside of the wire zone, non-capable species will be allowed to exceed 10 feet in height unless it is determined that they may encroach into the conductor safety zone prior to the next four-year maintenance cycle; and
- Site-specific erosion and sedimentation control plans will be developed and implemented for any structures located within these buffers.

These measures ensure that there will be no unreasonable disturbance or harm to this habitat.

In addition to the above measures, CMP proposed \$200,000 to be used to replace missing, non-functional or improperly installed culverts. These replacements will be coordinated with DIFW and interested non-governmental entities to identify those culverts whose replacements will re-connect valuable brook trout habitat.

iii. Habitat Fragmentation (Relevant to DEP Review)

CMP sited the NECEC Project to minimize habitat fragmentation. CMP accomplished this by co-locating more than 70% of the new transmission line within or immediately adjacent to existing transmission line corridors, rather than creating a new corridor for the entire transmission line.

In designing the Project route, CMP first located the route from the United States/Canada border to the nearest existing transmission line right of way by the most direct and shortest (i.e., straightest) route. It then modified this route to avoid sensitive and protected areas such as water bodies, wetlands, scenic vistas, conserved areas, and vernal pools. This process resulted in a new transmission line corridor 53.5 miles long that provides for the protection of wildlife and

fisheries, and ensures that there will be no unreasonable disturbance or harm to habitat through unreasonable habitat fragmentation.

This segment of new corridor would be located within an area of Maine that is working forest, actively managed on a 30- to 50-year cycle of harvest, regrowth, and re-harvest. As aerial photographs depict, the Project route and surrounding areas are divided throughout by skidder trails, logging roads, and other breaks in the forest. Many of these existing breaks are not revegetated. Conversely, the Project corridor will revegetate with trees and shrubs generally up to 10 feet tall. The corridor will be maintained in this condition throughout the life of the Project.

While this conversion of vegetation from forested to scrub/shrub will favor some species over others, the transmission line corridor will not generally impede the movement or migration of wildlife or plant species. In contrast to this transmission corridor “soft development” (where habitat is converted but retained as functional), “hard development” (such as roads and homes) results in a total loss of habitat, and has the practical effect of fragmenting habitat as it isolates areas of habitat from surrounding areas of viable habitat.

In fact, “soft development” breaks in forested cover cause an “edge effect,” which refers to the impact on plant and animal diversity where two or more different habitats meet. In many cases, edge effect results in greater species diversity, and greater population density of certain species, than that observed within individual habitats.

A wide variety of wildlife utilizes transmission line corridors. Mammals such as deer, moose, bear, fox, coyote, and rabbit, as well as snakes, birds, and amphibians, all utilize CMP corridors for reproduction, nesting, forage, cover from predators, hunting, and grazing. Animals

are attracted to transmission corridors due to the variety of food sources and habitats, and the diversity of other species.

The NECEC Project will cross 22 mapped (by the Maine Office of GIS) deer wintering areas (DWAs) of indeterminate value, totaling 44.3 acres, as well as 39 unmapped acres that are located within the upper Kennebec DWA. Construction and maintenance will not significantly affect the functional attributes of the DWAs intersected by the Project for the following reasons:

- Corridor construction will widen existing, non-forested transmission line corridors by an average of only approximately 75 feet. As such, the functional effects on these DWAs are expected to be indiscernible; after construction these DWAs are expected to function similar to the way they currently do.
- CMP maintains its transmission line corridors, and will maintain the Project, in a manner that encourages the growth of non-capable shrub species that provide important winter browse (woody plant buds and twigs) for over-wintering deer and in accordance with the CMP Post-Construction Vegetation Management Plan (Site Law Application Exhibit 10-2, revised January 2019) and CMP's Environmental Guidelines (Site Law Application Exhibit 14-1, revised June 2018).
- CMP avoided and minimized direct and temporary impacts through adjusting pole placement where possible and minimizing temporary access roads through these areas.
- CMP proposes to enhance wildlife habitat in the Project corridor adjacent to DWA by revegetating disturbed soils in upland areas with a wildlife seed mix promoted and developed by the Sportsman's Alliance of Maine ("SAM") and the Maine Seed Company.

Within the upper Kennebec River biological DWA, CMP will establish and maintain 10 deer winter travel corridors totaling approximately 1.1 linear miles. In these corridors, vegetation will be maintained either at full mature height (two segments for a distance of 2,610 feet) or at heights up to 35 feet (8 segments for a distance of 3,279 feet). This will ensure that deer have access to all areas within this DWA.

In summary, the NECEC Project will create a swath of permanently maintained scrub-shrub habitat in an area with a scarcity of such habitat, and characterized by a patchwork of clearcuts, and young and older tree (primarily softwood) regrowth. The inclusion of scrub-shrub

habitat within the larger landscape, while it will advantage some plant and animal species over others, will not adversely impact overall habitat and species diversity, and may improve it.

For these reasons, the Project will not unreasonably harm any significant wildlife habitat, or travel corridor, through habitat fragmentation. It will protect wildlife by maintaining suitable and sufficient habitat, and it will not disrupt or interfere with wildlife lifecycles. Further, a buffer strip of sufficient area will be established to provide wildlife with travel lanes between areas of available habitat. There will be no unreasonable disturbance to high and moderate value deer wintering areas or the habitat of any other species through habitat fragmentation. To the contrary, the siting of the Project ensures that it will not unreasonably degrade significant wildlife habitat, unreasonably disturb wildlife, or unreasonably affect the continued use of the site by the subject wildlife.

iv. Buffer Strips Around Cold Water Fisheries (Relevant to DEP Review)

The NECEC Project will be located in an area with rich and significant coldwater fisheries. In fact, DIFW noted that “viable brook trout habitat is not lacking in this region to the extent it might be elsewhere” [email from MDIFW’s Bob Stratton to Burns & McDonnell’s Mark Goodwin 7/31/2018, 8:04 AM]. While CMP does not agree that cold water fisheries are “significant wildlife habitat,” as defined in 38 M.R.S. § 480-B(10), the Project proposal includes several measures to avoid, reduce, minimize, and compensate for unavoidable impacts to these important fisheries, including:

- Preserving 12.02 linear miles of coldwater fishery habitat, including 7.9 miles of habitat and frontage along the Dead River;
- Replacing missing, non-functional and improperly installed culverts – both within the Project footprint and outside of the Project – to reconnect isolated coldwater fishery habitat to downstream areas;
- Donating \$180,000 to the Maine Endangered and Nongame Wildlife Fund, to pay for additional mitigation for unavoidable coldwater fishery impacts; and

- Performing stream crossings by heavy equipment during construction through the installation of equipment spans with no in-stream disturbances; streams will not be forded by heavy equipment.

Specific to buffers, CMP proposed 100-foot-wide riparian buffers on all coldwater fishery streams (as identified by DIFW), all four outstanding river segments crossed aurally by the Project (Kennebec River below Wyman Dam; Carrabassett River; Sandy River; and West Branch of the Sheepscot River), all waterbodies containing rare, threatened, or endangered species, and all perennial streams within the new (Segment 1) portion of the NECEC corridor. CMP has proposed an expanded buffer of 75 feet (rather than the standard 25 feet) for all other streams that do not meet the above criteria.

Within these riparian buffers, the following practices will apply:

- During construction, removal of capable species or dead or hazard trees within the appropriate stream buffer will typically be accomplished by hand-cutting. Mechanized harvesting equipment will be used only if supported by construction matting or during frozen conditions in a manner (i.e., use of travel lanes and reach-in techniques) that preserves non-capable vegetation less than 10 feet in height to the greatest extent possible.
- During maintenance, removal of capable species and dead or hazard trees will be accomplished by hand-cutting only. Mechanized harvesting equipment will not be used;
- Herbicides will not be stored, mixed, or transferred between containers unless done on a paved public access road;
- No refueling or maintenance of equipment, including chainsaws, will occur unless done on a paved public access road, or if secondary containment is used with oversight from an environmental inspector;
- The boundary of each stream buffer will have unique flagging installed to distinguish between the applicable 75-foot or 100-foot stream buffer prior to vegetation management activities;
- No slash will be left within 50 feet of the edge of any stream;
- Initial tree clearing will be performed during frozen ground conditions whenever practicable, and if not practicable, the recommendations of the environmental inspector will be followed regarding the appropriate techniques to minimize disturbance such as the use of selectively placed travel lanes within the stream buffer. CMP will not place any transmission line structures within the stream buffer, unless specifically authorized by the DEP and accompanied by a site specific erosion control plan; and

- Structures will not be placed within 25 feet of any stream regardless of its classification.

In addition, undisturbed buffers will be maintained on both the east and west sides of the upper Kennebec River in the vicinity of the HDD crossing. Specifically, an undisturbed buffer of 1,160 feet will be maintained along the west bank of the river in this area, and an undisturbed buffer of 1,450 feet will be maintained along the east bank of the river in this area. Within these two buffers, vegetation will not be maintained and CMP does not anticipate a need to cut these trees, and thus they will grow to their full height.

These expanded riparian buffers will protect water quality, minimizing ground disturbance and the potential for sediments or herbicides to enter coldwater fisheries (and other streams); minimize insolation and water temperature increases; and retain wildlife travel corridors within riparian zones.

CMP therefore has made adequate provision for buffer strips around cold water fisheries, given that water bodies within or adjacent to the Project will be adequately protected from sedimentation and surface runoff by buffer strips, and these buffer strips will provide adequate space for movement of wildlife between important habitats. The Project will not unreasonably harm cold water fisheries.

v. Issue 2 Conclusion (Relevant to DEP Review)

There will be no unreasonable harm to or adverse effect on the Roaring Brook Mayfly, Spring Salamanders, or Brook Trout habitat, and the Project will not unreasonably harm any significant wildlife habitat, or travel corridor, through habitat fragmentation. Alteration of such habitat and disturbance of such wildlife has been kept to the minimum amount necessary, and the Project does not unreasonably degrade such habitat, unreasonably disturb such wildlife, or

unreasonably affect the continued use of the site by such wildlife. CMP has made adequate provision for buffer strips around cold water fisheries.

d. Issue 3 (Alternatives Analysis)

i. Alternatives Analysis (Relevant to DEP and LUPC Review)

The NECEC Project was carefully and thoughtfully sited and designed to avoid, to the maximum extent practicable, protected and sensitive resources.

CMP began its alternatives analysis by considering the purpose of the NECEC Project, namely, to transmit 1,200 MW of renewably generated electricity from Canada to New England. CMP considered the no-action alternative. However, this alternative would not meet the Project purpose. For this reason, the no-action alternative was rejected.

In determining its Preferred Route alternative, CMP's primary consideration was identifying the closest existing transmission line corridor – Section 222 in The Forks Plantation – and evaluating the optimal route from the United States/Canada border to the Section 222 corridor. CMP's Project route and alternatives analysis purposely avoided siting the Project in state and national parks, recreation areas, areas with protected or sensitive natural or cultural resources, and areas with high scenic values and sensitivity.

The alternative routes considered included the HVDC line component, from the United States/Canada border to the interconnection point with the grid at Larrabee Road Substation (Segments 1, 2 and 3) and the associated substation upgrades. All other Project components (i.e., Segments 4 and 5) are being proposed in existing CMP corridors and, as such, the alternatives to these line sections would be to site these sections in new corridors, which would not meet the objective of the least environmental impact.

CMP evaluated alternate routes based on the following 11 criteria with respect to route selection. Each criterion is followed by an indication of its desirability for NECEC routing; data for criteria comparisons were derived primarily from publicly-available sources such as the Maine Office of Geographic Information Systems website:

- Conserved Lands [fewer are better]
- Undeveloped Right of Way [more is better]
- Clearing [less is better]
- Stream Crossings [fewer are better]
- Transmission Line Length [shorter is better]
- National Wetlands Inventory (NWI) Mapped Wetlands [fewer are better]
- Deer Wintering Areas [fewer are better]
- Inland Waterfowl and Wading Bird Habitat [fewer are better]
- Public Water Supplies [fewer are better]
- Significant Sand and Gravel Aquifers [fewer are better]
- Parcel Count Total [fewer are better]

CMP compared the Preferred Alternative route to two alternative routes, known as HVDC Alternative 1 and HVDC Alternative 2, based on the above parameters.

HVDC Alternative 1 was based on a route CMP had previously considered, and acquired option agreements on, for a different project. It would be located primarily in new corridor and partially in undeveloped width of existing corridors.

HVDC Alternative 2 would extend from the United States/Canada border to Lewiston, partially in new corridor and partially in undeveloped width of existing corridors. Comparison of the Preferred Alternative to DC Alternative 1 demonstrated the following (from September 2017 NRPA application):

Table 2-1: Comparison of NECEC Preferred Alternative to Alternative 1

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

Comparison of the Preferred Alternative to DC Alternative 2 demonstrated the following
(from September 2017 NRPA application):

Table 2-2: Comparison of NECEC Preferred Alternative to Alternative 2

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

These comparisons affirmed that the Preferred Alternative route is the optimal route for several reasons:

- The Preferred Alternative route crosses fewer conserved land parcels than either alternative, and therefore minimizes habitat fragmentation.
- The Preferred Alternative route requires significantly less new transmission line corridor to be developed than HVDC Alternative 1.
- The Preferred Alternative route required acquisition of significantly fewer land parcels than either alternative. This point of comparison is critical in two respects:
 - Fewer required land parcels equates to a higher likelihood of successful acquisition of all needed lands. The eventual acquisition of land rights to the Preferred Alternative made this route more feasible than either alternative; and

- Fewer required land parcels, and therefore larger land parcels owned by each entity, allowed CMP to negotiate with these same landowners to adjust the transmission line corridor route to avoid impacts to protective and sensitive natural resources.
- The Preferred Alternative has fewer wetland and stream crossings than HVDC Alternative 2.
- HVDC Alternative 2 would require land acquisition across Penobscot Indian Nation land, the Bigelow Preserve, and the Appalachian Trail corridor.
- HVDC Alternative 2 structures would likely be visible from points along the Appalachian Trail, Bigelow Preserve, and Sugarloaf Mountain ski area.

Regarding analysis of alternative locations for the Merrill Road, Lewiston converter station and the Fickett Road, Pownal new substation, I incorporate by reference the testimony of Brian Berube, CMP Real Estate Manager.

ii. Alternatives Analysis Specific to the P-RR Subdistrict (Relevant to LUPC Review)

The proposed transmission line in Beattie Township would be located approximately $\frac{1}{4}$ mile from Beattie Pond, which is an LUPC Management Class VI Lake (also referred to as a Remote Pond). There is an existing access road within 400 feet of Beattie Pond. The P-RR zoning is intended to protect the pond from permanent improvements in access that could lead to more intensive use or development. The transmission line corridor at a distance greater than existing developed road access will not include permanent improvements or promote more intensive use or development of the pond, and is therefore consistent with the intent of the P-RR zoning.

CMP attempted to negotiate an alternative alignment south of the Beattie Pond P-RR subdistrict through Merrill Strip Township, and offered landowner Bayroot LLC between 150% and 200% of fair market value, but was unable to reach mutually-acceptable terms with the landowner, which demanded almost 50 times fair market value. Re-routing north of Beattie Pond to avoid the P-RR subdistrict would result in approximately two miles of additional

corridor and associated vegetation clearing, and would lead to potentially higher visibility from the pond, due to the higher elevations associated with Caswell Mountain to the north. Neither alternative route is suitable for the proposed use, and neither is reasonably available to CMP.

The Appalachian Trail crosses the transmission line (the National Park Service holds an easement on CMP fee-owned land) at three locations close to Moxie Pond in Bald Mountain Township. The configuration of the AT within and adjacent to an approximately 3,500-foot long portion of transmission line corridor prevented CMP from avoiding direct impacts to the P-RR subdistrict in this area. Any alternative alignments of the transmission line would result in crossings of the Appalachian Trail in one or more locations where there are currently no transmission line corridors. Co-location of the new transmission line within the existing transmission line corridor is therefore the least environmentally-damaging practicable alternative. CMP has proposed buffer plantings along both the east and west sides of Troutdale Road (aka Moxie Pond Road or Trestle Road) where the AT is co-located within this road, and has thus buffered the new transmission line adequately from other uses in this area.

The upper Kennebec River is also zoned P-RR in the vicinity of the Project. After initially proposing to cross the Kennebec River aerially, CMP determined that crossing beneath the river using HDD would avoid adverse visual impacts on recreational users of this outstanding river segment and the associated concerns of environmental regulators, the host communities, and other stakeholders.

Given the need to transmit power from the Beattie Township / Canada border area to the Lewiston converter station, it was necessary to identify a feasible and optimal location at which to cross the Kennebec River. Three alternative Kennebec River crossing locations were evaluated by CMP: (1) north of Moxie Stream between Moxie Gore and West Forks Plt (the

Preferred Alternative); (2) on CMP land about one mile downstream of Harris Dam (the CMP Land Alternative); and (3) near the Harris Station powerhouse (the Brookfield Alternative). Each of the latter two alternatives had significant environmental and logistical disadvantages.

The CMP Land Alternative would have required acquisition of land from a private landowner. Also, that alternative route would be 5.1 miles longer than the Preferred Alternative, which would create significantly greater environmental impacts.

The Brookfield Alternative would require widening 900 +/- feet of the Jackman tie line corridor, which would require use of Brookfield land that is encumbered by the Moosehead Kennebec Headwaters conservation easement. This alternative would also require Federal Energy Regulatory Commission (FERC) and Brookfield approval for use of land that is within the Harris Hydropower facility FERC boundary. Finally, this alternative route would be 6.3 miles longer than the Preferred Alternative, which would create significantly greater environmental impacts.

For the above reasons only the Preferred Alternative is suitable to the proposed use and reasonably available to the applicant, and buffered from those other uses or resources within the subdistrict with which it is incompatible.

iii. Issue 3 Conclusion (Relevant to DEP and LUPC Review)

There are no alternatives to the proposed location and character of the Project that would lessen its impact on the environment or the risks it would engender to the public health or safety, without unreasonably increasing its cost. Nor is there any reasonable alternative to the crossings of the outstanding river segments discussed above that would have less adverse effect upon the natural and recreational features of those river segments. There is no practicable alternative to

the project that would be less damaging to the environment. Also, there is no practicable alternative to the proposed activity that would have less visual impact, as discussed above.

There is no alternative site to the locations where the Project is located in the P-RR subdistrict of the LUPC that is both suitable to the proposed use and reasonably available to CMP.

e. Issue 4 (Compensation and Mitigation)

i. Cold Water Fisheries Habitat (Relevant to DEP Review)

The Project proposal includes several measures to avoid, reduce, minimize and compensate for unavoidable impacts to cold water fisheries habitat, including (as described above):

- Preservation of 12.02 linear miles of coldwater fishery habitat, including 7.9 miles of habitat and frontage along the Dead River;
- Replacing missing, non-functional and improperly installed culverts – both within the Project footprint and outside of the Project – to reconnect isolated coldwater fishery habitat to downstream areas; and
- Donation of \$180,000 to the Maine Endangered and Nongame Wildlife Fund, to pay for additional mitigation for unavoidable coldwater fishery impacts; stream crossings by heavy equipment during construction will be performed through the installation of equipment spans with no in-stream disturbances, and streams will not be forded by heavy equipment.

CMP has also proposed 100-foot-wide riparian buffers on all coldwater fishery streams (as identified by the DIFW), all four outstanding river segments crossed overhead by the Project, all water bodies containing rare, threatened, or endangered species, and all perennial streams within the new (Segment 1) portion of the NECEC corridor. CMP has proposed an expanded buffer of 75 feet (rather than the standard 25 feet) for all other streams that do not meet the above criteria.

In addition, undisturbed buffers will be maintained on both the east and west sides of the upper Kennebec River in the vicinity of the HDD crossing. Specifically, an undisturbed buffer of 1,160 feet will be maintained along the west bank of the river in this area, and an undisturbed buffer of 1,450 feet will be maintained along the east bank of the river in this area. Within these two buffers, vegetation will not be maintained and CMP does not anticipate the need to cut trees, and thus these will grow to their full height.

Within these riparian buffers, the following practices will apply that will avoid, minimize, rectify, reduce, or eliminate impact:

- During construction, removal of capable species or dead or hazard trees within the appropriate stream buffer will typically be accomplished by hand-cutting. Mechanized harvesting equipment will be used only if supported by construction matting or during frozen conditions in a manner (i.e., use of travel lanes and reach-in techniques) that preserves non-capable vegetation less than 10 feet in height to the greatest extent possible.
- During maintenance, removal of capable species and dead or hazard trees will be accomplished by hand-cutting only. Mechanized harvesting equipment will not be used;
- Herbicides will not be stored, mixed, or transferred between containers unless done on a paved public access road;
- No refueling or maintenance of equipment, including chainsaws, will occur unless done on a paved public access road, or if secondary containment is used with oversight from an environmental inspector;
- The boundary of each stream buffer will have unique flagging installed to distinguish between the applicable 75-foot or 100-foot stream buffer prior to vegetation management activities;
- No slash will be left within 50 feet of the edge of any stream;
- Initial tree clearing will be performed during frozen ground conditions whenever practicable, and, if not practicable, the recommendations of the environmental inspector will be followed regarding the appropriate techniques to minimize disturbance such as the use of selectively placed travel lanes within the stream buffer. CMP will not place any transmission line structures within the stream buffer, unless specifically authorized by the MDEP and accompanied by a site specific erosion control plan; and
- Structures will not be placed within 25 feet of any stream regardless of its classification.

These expanded riparian buffers will protect water quality, minimizing ground disturbance and the potential for sediments or herbicides to enter coldwater fisheries (and other streams); minimize insolation and water temperature increases; and retain wildlife travel corridors within riparian zones.

CMP has adequately mitigated and compensated for impact on cold water fisheries habitat.

ii. Outstanding River Segments (Relevant to DEP Review)

CMP protected the natural and recreational attributes of the Upper Kennebec River, an outstanding river segment, by modifying its original 2017 proposal in late 2018 to cross beneath the Upper Kennebec River utilizing HDD technology. This method retains the natural beauty of this river segment, and protects the values that qualified the Upper Kennebec River as an outstanding river segment.

The other four NECEC Project crossings of outstanding river segments (Kennebec River below Wyman Dam; Carrabassett River; Sandy River; and West Branch of the Sheepscot River) are all within existing transmission line corridors, and therefore will be co-located with other transmission lines at these crossings. As a result, the visual impacts of these new crossings will be minimal.

CMP has proposed to retain 100-foot riparian buffers along each of these four outstanding river segment aerial crossings. Within these riparian buffers, the following practices will apply to mitigate any impact:

- During construction, removal of capable species and dead or hazard trees within the appropriate stream buffer will typically be accomplished by hand-cutting. Mechanized harvesting equipment will be used only if supported by construction matting or during frozen conditions in a manner (i.e., use of travel lanes and reach-in techniques) that preserves non-capable vegetation less than 10 feet in height to the greatest extent possible.

- During maintenance, removal of capable species and dead or hazard trees will be accomplished by hand-cutting only. Mechanized harvesting equipment will not be used;
- Herbicides will not be stored, mixed, or transferred between containers unless done on a paved public access road;
- No refueling or maintenance of equipment, including chainsaws, will occur unless done on a paved public access road, or if secondary containment is used with oversight from an environmental inspector;
- The boundary of each stream buffer will have unique flagging installed to distinguish between the applicable 75-foot or 100-foot stream buffer prior to vegetation management activities;
- No slash will be left within 50 feet of the edge of any stream;
- Initial tree clearing will be performed during frozen ground conditions whenever practicable, and if not practicable, the recommendations of the environmental inspector will be followed regarding the appropriate techniques to minimize disturbance, such as the use of selectively placed travel lanes within the stream buffer. CMP will not place any transmission line structures within the stream buffer, unless specifically authorized by the MDEP and accompanied by a site specific erosion control plan; and
- Structures will not be placed within 25 feet of any stream regardless of its classification.

In addition, undisturbed buffers will be maintained on both the east and west sides of the upper Kennebec River in the vicinity of the HDD crossing. Specifically, an undisturbed buffer of 1,160 feet will be maintained along the west bank of the river in this area, and an undisturbed buffer of 1,450 feet will be maintained along the east bank of the river in this area. Within these two buffers, vegetation will not be maintained and CMP does not anticipate the need to cut these trees, thus they will grow to their full height.

These expanded riparian buffers will protect water quality, minimizing ground disturbance and the potential for sediments or herbicides to enter cold water fisheries (and other streams); minimize insolation and water temperature increases; and retain wildlife travel corridors within riparian zones. These buffers will help retain the outstanding river segments' natural and recreational values.

iii. Wetlands (Relevant to DEP Review)

CMP located and designed the Project to avoid as many wetlands as possible. However because of the pervasive nature of wetlands in Maine, the NECEC Project unavoidably crosses wetlands. Unavoidable wetland impacts include direct impacts (temporary and permanent fill) and indirect impacts (conversion of forested wetlands to scrub-shrub wetlands). Specific wetland impacts and their respective compensation include:

- *Temporary fill:* 47.7 acres of temporary wetland fill (primarily construction mats, an environmental best practice); preservation of 57 acres of wetlands plus \$154,500 in-lieu fee. In practice, many wetland crossings during construction will occur during frozen ground conditions, therefore the above is a conservative, worst-case estimate. Temporary wetland fill will be in place for a typical period of 12 months, and no more than 18 months.
- *Permanent fill:*
 - 105.5 acres of permanent cover type conversion of forested wetlands;
 - 3.8 acres of permanent fill in wetlands of special significance (WOSS); and
 - 0.3 acre of permanent fill in non-WOSS wetlands.
 - Preservation of 440 acres of wetlands to compensate for the above impacts.

Wetland crossings for construction access will be located at the narrowest point of each wetland if conditions and construction access allow this.

Compensation for temporary wetland impacts, required by the U.S. Army Corps of Engineers (USACE), consists of the preservation of three compensation tracts – Flagstaff Lake Tract, Little Jimmie Pond-Harwood Tract, and Pooler Pond Tract – plus an in-lieu fee. Collectively, these tracts contain 511 acres of wetlands, and are offered to offset temporary fill in wetlands, and other wetland impacts, at the USACE required ratios and using USACE approved adjustments.

Compensation for forested wetland conversion is also required by USACE. Using the USACE ratio of 20:1 and the 15% adjustment, CMP is proposing 316 acres of wetland preservation to offset these impacts.

The conversion of wetlands from forested to scrub-shrub results in a shift in functions and values, but no net loss of functions and values. Regardless, CMP has offered significant preservation land and in-lieu fees to compensate for wetland impacts.

CMP has proposed a robust, proportionate and diverse compensation plan that includes the following components to offset unavoidable impacts to protected and sensitive natural resources:

In-Lieu Fees

- \$594,000 (compensation for temporary wetland fill)
- \$1,046,000 (compensation for permanent wetland fill)
- \$71,000 (compensation for vernal pool upland habitat fill)
- \$56,000 (compensation for vernal pool upland habitat conversion from forested to shrub)
- \$2,113,000 (Army Corps jurisdictional vernal pool clearing impacts)
- Total in-lieu fees = \$3,880,000

Other Compensation Fees

- \$1,225,000 (conversion of unique forest communities to shrub)
- \$470,000 (conversion from forested to shrub in rare invertebrate conservation management areas)
- \$200,000 (culvert replacement program to enhance coldwater fisheries habitat connectivity)
- \$180,000 (Maine Endangered & Nongame Wildlife Fund contribution)
- \$10,000 (Goldie's wood fern (special concern species) survey funding to Maine Natural Areas Program)
- Total Other Fees = \$2,085,000

Total Fees = \$5.965M

Conserved Land

- 2,076 acres (to offset wetland cover type conversion, waterfowl upland habitat conversion and fill)
 - Includes 8.1 miles frontage on Dead River (Outstanding River Segment)
- 717 acres (within upper Kennebec Deer Wintering Area)

Total Conserved Land = 2,793 acres

Other Mitigation

- Redesign of transmission line and adjacent co-located transmission line to avoid State-endangered Small Whorled Pogonia in Greene. Cost: \$2.3M.
- Taller structures at Gold Brook and Mountain Brook to allow full-height vegetation in threatened invertebrate habitat. Incremental cost: \$1.9M.
- Vegetation tapering at Coburn Mountain and Gold Brook (visual impact mitigation). Incremental cost: \$22,200/year.
- Maintenance of deer winter travel corridors in upper Kennebec DWA. Incremental cost: \$9,400/year.
- Expanded riparian buffers (100' vs. 25') at all Outstanding River Segments crossed aerially by the Project, all perennial streams within 54-mile new corridor segment, all cold water fishery streams, and all rivers / streams / brooks containing threatened or endangered species.
- Revegetating disturbed soils adjacent to DWAs with wildlife seed mix specifically formulated to optimize nutritional value to wildlife during late fall and early spring when woods forage is sparse.

Vernal pool impacts have been avoided on the NECEC Project to the maximum extent practicable; however, because of the large land area of vernal pools' critical terrestrial habitat (CTH) -- 250 feet beyond the pool depression for state-regulated significant vernal pools (SVPs) and 750 feet beyond the pool depression for USACE-jurisdictional vernal pools) -- impacts from fill and conversion of forested to scrub-shrub cover types within their CTH is unavoidable.

Direct (fill) impacts to SVPs include 0.74 acre of wetland. Indirect impacts within SVPs include 3.9 acres of permanent forested wetland conversion, and 29.6 acres of permanent upland

conversion. Using the DEP's in-lieu fee formula, CMP proposes a payment of approximately \$642,000 to offset these impacts.

The NECEC Project will result in direct (fill) and / or indirect (cover type conversion) impacts to 49 high value, 122 medium value, and 71 low-value USACE-jurisdictional vernal pools. CMP calculated that the existing average forested cover within the 750-foot CTH of these pools is 73.6%, and that post-construction, the average forested cover within these pools' CTH would be 68.9%, a reduction of 4.7%. Based on this, and based on data gathered and analyzed by TRC during the 2009 to 2015 Maine Power Reliability Program (MPRP) project that demonstrates a de minimis impact of tree clearing on vernal pool productivity, application of the USACE's 2016 Compensatory Mitigation Guidance resulted in an in-lieu fee of approximately \$1.64M to offset these impacts. In addition, CMP has calculated and offered a fee of approximately \$382,000 to offset direct (fill) impacts to these vernal pools, for a total fee of approximately \$2.02M. The location, type, and amount of compensation that CMP has offered fully satisfies the DEP's rules and the USACE's Guidance.

iv. Issue 4 Conclusion (Relevant to DEP Review)

The compensation and mitigation measures proposed by CMP fully compensates for all impacts to cold water fisheries, outstanding river segments, and wetlands that cannot be avoided.

V. Conclusion (Relevant to DEP and LUPC Review)

CMP has carefully and thoughtfully sited and designed the NECEC Project to avoid impacts wherever and whenever possible, minimize unavoidable impacts, and compensate for these unavoidable impacts.

Avoidance and minimization of impacts started with route selection. CMP evaluated alternate routes and selected the route from the U.S./Canada border that avoided areas of highest

recreational, natural resource, and visual sensitivity to the greatest extent possible. Along this chosen route, CMP worked with large landowners so that if small route adjustments were necessary to avoid direct or indirect impacts to protected or sensitive natural resources, these same landowners could provide the necessary land rights to do this. As such, many resources such as rare species, significant vernal pools, wetlands, ponds, streams, and conserved lands that would otherwise have been difficult to avoid or route around, were avoided and protected.

Two examples of this effort and its results are: CMP redesigned the transmission line to avoid direct or indirect impacts to the state-endangered small whorled pogonia in Greene, at an incremental cost of \$2.3 million. As well, CMP designed and proposed taller structures to allow full height vegetation at two water bodies, to protect habitat of Roaring Brook Mayfly (which is state-threatened) and Northern Spring Salamander (which is a species of special concern), at an incremental cost of \$1.9 million. Expanded stream riparian buffers also help to protect water quality, reduce insolation and associated water temperature increases, and protect cold water fisheries habitat.

Compensation of unavoidable NECEC Project impacts has been offered in multiple forms and for numerous purposes. Offered in-lieu fees total \$3.88 million and other compensation fees total \$2,085 million. Lands proposed for permanent preservation total nearly 2,800 acres. Provisions for tapering of transmission corridor vegetation at two locations – Coburn Mountain and Gold Brook – increase vegetation maintenance costs by more than \$22,000 per year, and maintenance of winter deer travel corridors in the upper Kennebec River deer wintering area increase vegetation management costs by more than \$9,000 per year.

The above examples illustrate that CMP has designed and sited the NECEC Project in a manner that respects sensitive resources, and avoids significant and unreasonable impacts those resources.

Exhibits:

- CMP-2-A: Gerry J. Mirabile CV
- CMP-2-B: Project Overview Map with Segments
- CMP-2-C: Project Overview Map
- CMP-2-D: Project Recreation Areas Map
- CMP-2-E: Beattie Pond Modification Proposal & Photosimulations
- CMP-2-F: HDD Termination Station Photosimulations
- CMP-2-G: Three Slide Mountain Photosimulation

Dated: 2/26/2019

Respectfully submitted,

Gerry Mirabile
Gerry Mirabile

STATE OF MAINE
Kennebec, ss.

The above-named Gerry Mirabile did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Dated: 2/26/2019

Before,

Patricia Ann Larrivee

Notary Public

Name:

My Commission Expires:

PATRICIA ANN LARRIVEE
Notary Public, Maine
My Commission Expires April 7, 2019

GERRY J. MIRABILE

gerry.mirabile@cmpco.com

w 207-629-9717, c 207-242-1682

PROFESSIONAL EXPERIENCE**ENVIRONMENTAL**

- Broad and in-depth knowledge of environmental aspects and impacts of electric utility operations and practices.
- Manage consultants responsible for preparation of federal, state, and local permit applications for transmission/distribution lines, substations, service facilities, navigational aids, and submerged utilities.
- Advise AVANGRID staff and contractors on facility siting and permitting.
- Present project proposals to federal and state regulators, planning/zoning boards, city councils, and citizen groups.
- Monitor, evaluate, and develop testimony and comments on proposed environmental, land use, permitting, vegetation management, chemical release, regulatory reporting, wildlife and fisheries, zoning, stormwater, underground tanks, erosion control, and waste management legislation and regulations.
- Develop compliance plans and advise/train AVANGRID staff and contractors on project-specific permit conditions.
- Identify and oversee third-party inspectors and contracts; review and respond to third-party inspection reports for AVANGRID capital projects.
- Coordinate with USFWS and non-profits on New England Cottontail and American kestrel survey and enhancement efforts on CMP transmission line rights of way.
- Review and edit compensation site restoration and monitoring reports.
- Developed construction-phase and maintenance-phase sensitive and protected resource management plans for capital projects.

COMMUNICATIONS & REGULATORY

- Drafted and submitted to regulatory agencies numerous summaries of environmental studies conducted in support of FERC and other Federal, state, and regional permit applications.
- Represented CMP before Maine Legislature's Environment and Natural Resources Committee, and Energy, Utilities and Technology Committee; developed and delivered expert testimony on wind energy and utility permitting, wastewater licensing, toxics use reduction, oil spill reporting, PCB's, stormwater management, wetlands, and wetlands mitigation legislation. Developed compliance plans when bills became laws.
- Develop comments and provide written and verbal response to regulators, regulatory boards, and legislators on various draft rules and legislation.
- Represented CMP on statewide linear projects vegetation management BMPs task force.
- Represent CMP on Maine State Chamber of Commerce Environmental and Energy Policy Committee.
- Testified before State Board of Environmental Protection regarding licensing of CMP's Hazardous Waste Storage facility and on numerous regulatory and rulemaking proposals.
- Represent CMP interests, pursue approvals, and clarify compliance requirements with federal, state, and local regulators.

EMPLOYMENT HISTORY

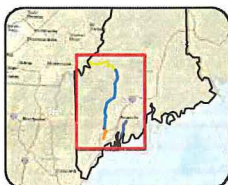
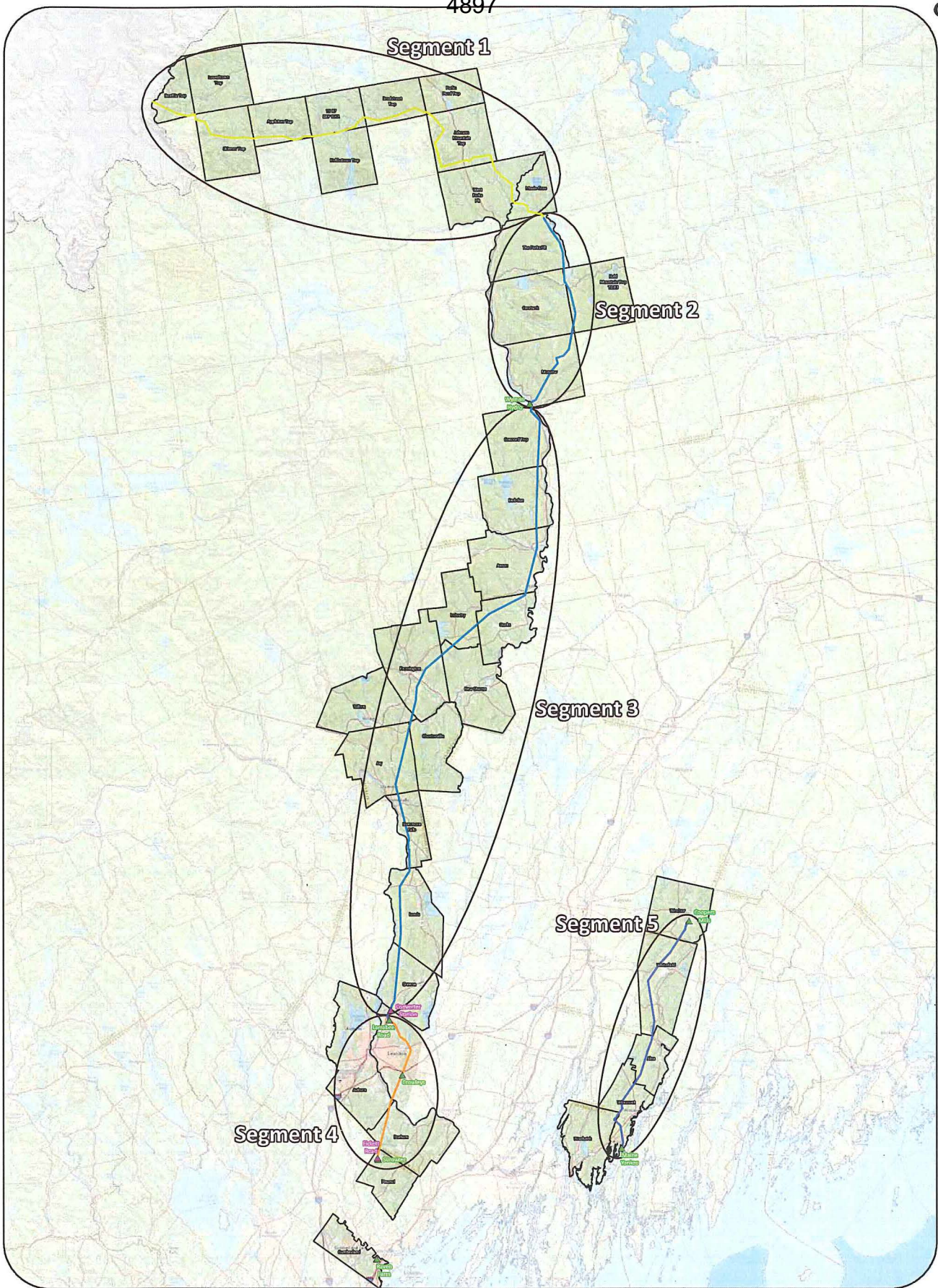
2017 to present	AVANGRID/CENTRAL MAINE POWER COMPANY (Augusta, ME) <i>Manager – NECEC Permitting</i>
2015 to 2017	AVANGRID/CENTRAL MAINE POWER COMPANY (Augusta, ME) <i>Manager – Programs/Projects & Supervisor, Environmental Compliance Department</i>
2013 to 2015	AVANGRID/CENTRAL MAINE POWER COMPANY (Augusta, ME) <i>Manager – Programs/Projects, Environmental Compliance Group</i>
1989 to 2013	CENTRAL MAINE POWER COMPANY (Augusta, ME) <i>Environmental & Licensing Coordinator, Environmental Specialist, Senior Environmental Specialist, Lead Analyst – Compliance</i>
1985 to 1989	MAINE DEPARTMENT OF ENVIRONMENTAL PROTECTION (Augusta, ME) <i>Conservation Aid, Environmental Specialist II/III</i>

EDUCATION

Husson University, Bangor, Maine	
<i>Master of Business Administration (MBA)</i>	2013
<i>Master of Science in Business (MSB)</i>	2000
Johnson State College, Johnson, Vermont	
<i>Bachelor of Science in Ecology (BS)</i>	1984
Recipient, Award for Excellence in Ecology	

CERTIFICATIONS

Erosion and Sedimentation Control Practices (Maine DEP)	2008 to present
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Legend

- HVDC (New ROW)
- HVDC (Existing ROW)
- New 345 kV Line
- Rebuild Sections
- ▲ Existing Substation
- ▲ Proposed Substation

**New England
Clean Energy Connect
Overview Map**

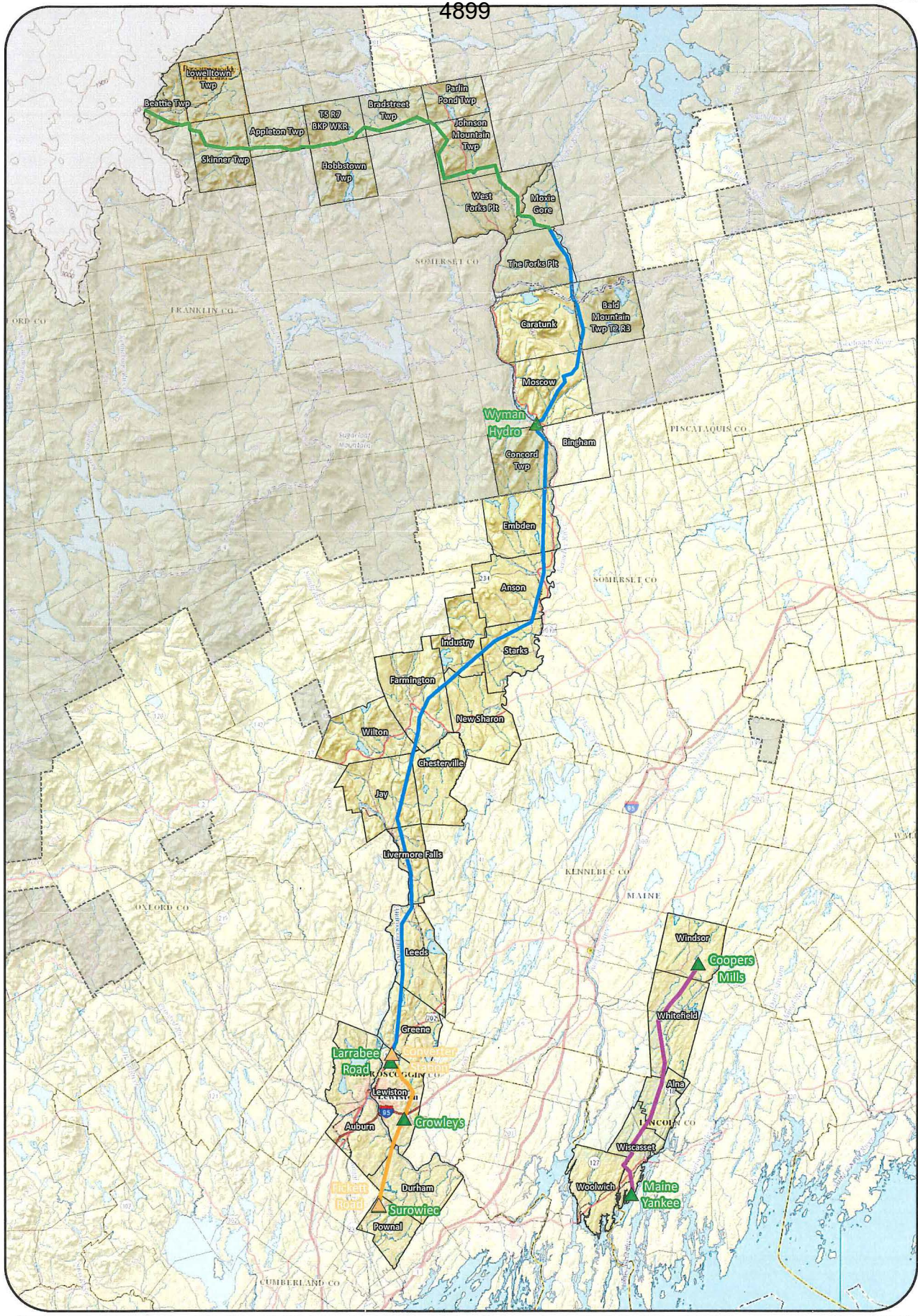


0 10 Miles



CENTRAL MAINE
POWER

4899



Legend

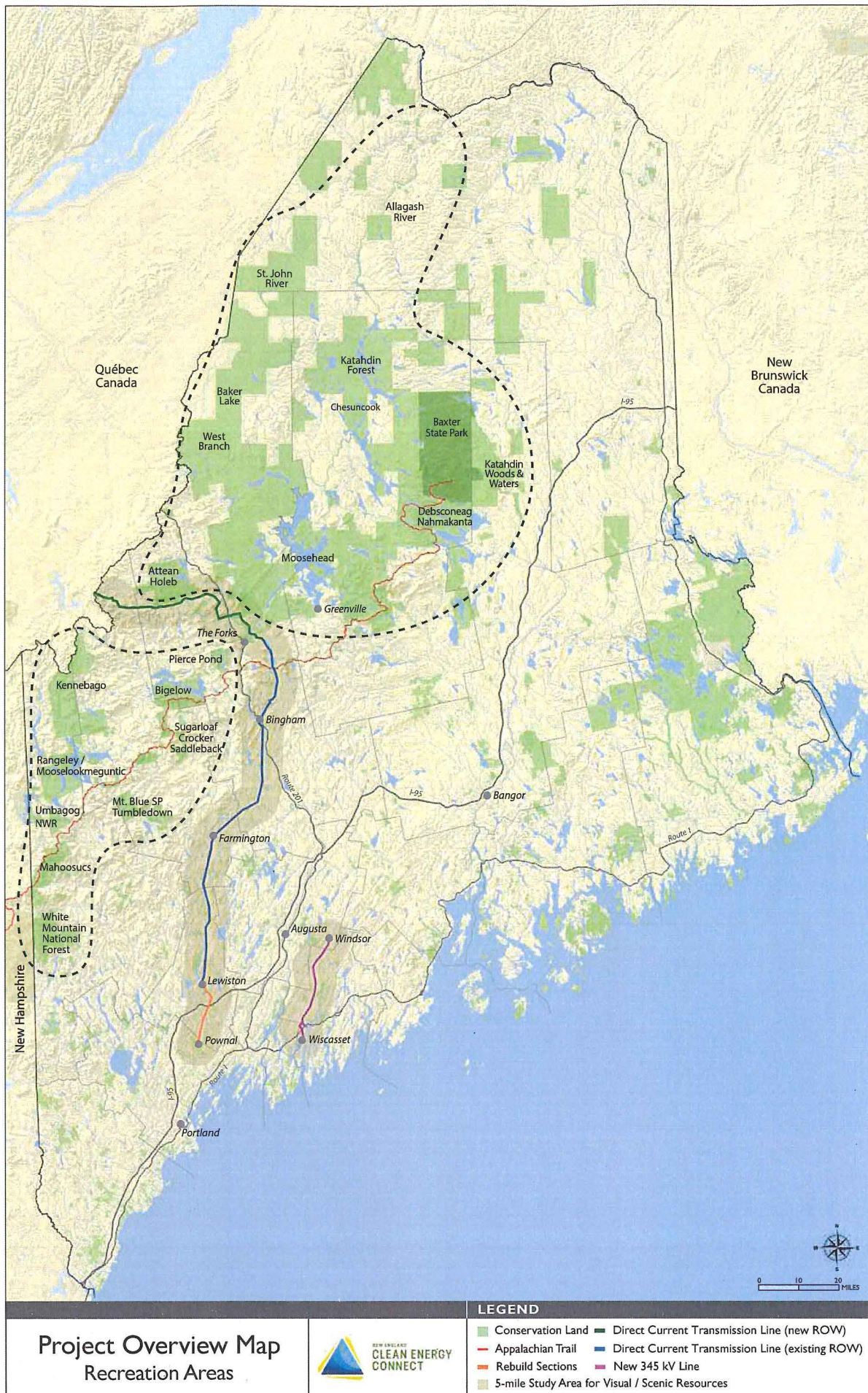
- Direct Current Transmission Line (new ROW)
- Direct Current Transmission Line (existing ROW)
- New 345 kV Line
- LUPC Zone
- Rebuild Sections
- Existing Substation
- Proposed Substation

New England Clean Energy Connect

Overview Map

10 Miles







January 25, 2019

Mr. Bill Hinkel
Land Use Planning Commission
Department of Agriculture, Conservation and Forestry
18 Elkins Lane
Augusta, Maine 04330

Mr. James R. Beyer
Maine Department of Environmental Protection
Division of Land Resources Regulation
106 Hogan Road
Bangor, ME 04401

**RE: New England Clean Energy Connect Project
Project Design Modification & Beattie Pond Photosimulations**

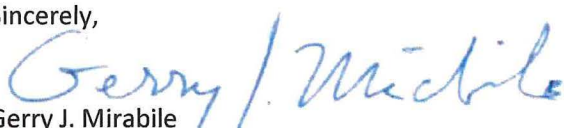
Dear Mr. Hinkel and Mr. Beyer:

Central Maine Power Company (CMP) has evaluated the engineering design associated with transmission line structures adjacent to Beattie Pond in Lowelltown Township on the proposed New England Clean Energy Connect (NECEC) Project. CMP has determined that lowering the structure closest to Beattie Pond (a Management Class 6, remote pond) by 39 feet is feasible. CMP is proposing this redesign to reduce the overall visual impact from the pond; as a result of this redesign, the Project will be minimally visible by recreational users on the pond.

Please find the attached photo simulation package that includes views of the original (September 2017) design and views of the proposed redesign depicting the reduced visibility associated with the new design.

If you have any questions regarding this submittal, please give me a call at (207) 629-9717 or email gerry.mirabile@cmpco.com.

Sincerely,


Gerry J. Mirabile
Manager – Environmental Projects
Environmental Permitting
AVANGRID Networks, Inc.

Enclosures

cc: MDEP Service List; LUPC Service List
File: New England Clean Energy Connect

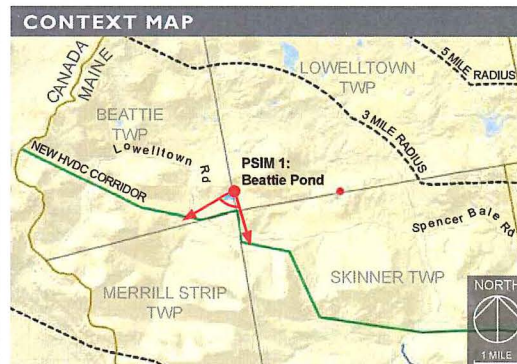
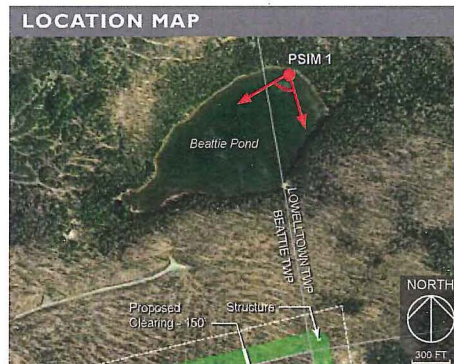
Appendix D: Photosimulations

PHOTOSIMULATION 1: BEATTIE POND, LOWELLTOWN TWP



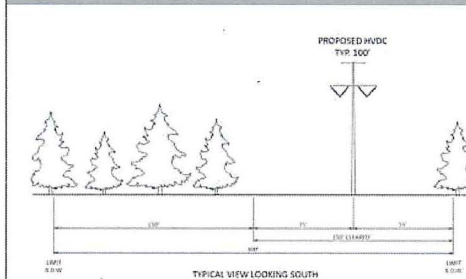
September 2017 Proposed Conditions: Panoramic view looking southeast to southwest from the northern end of Beattie Pond toward the proposed HVDC transmission line. Beattie Pond is a Management Class 6, Remote Pond. The tops of one structure and conductors will be visible at a distance of 1,300' +/- from this viewpoint. Existing topography and shoreline vegetation will screen the rest of the Project from view. Merrill Mountain is visible on the right side of the image. See Appendix B: Study Area Photographs for additional images.

The original September 2017 caption incorrectly noted the distance between the closest structure and the viewpoint as 1,300 feet, but that distance is actually the approximate distance between the closest structure and the edge of the pond.



TECHNICAL INFORMATION

Typical Cross Section



Photograph / Photosimulation Information

Location	45.503894°, -70.631858°
Viewing Direction	Southeast to Southwest
Horizontal Angle of View	86°
Date and Time	07/26/17 at 12:46 pm
Camera Focal Length	35 mm
Camera Make/Model	Nikon D5500
Photo Source	TJD&A
Proposed Structures Visible	1
Approximate Distance to Nearest Visible Structure	2,177 feet



tjd&a

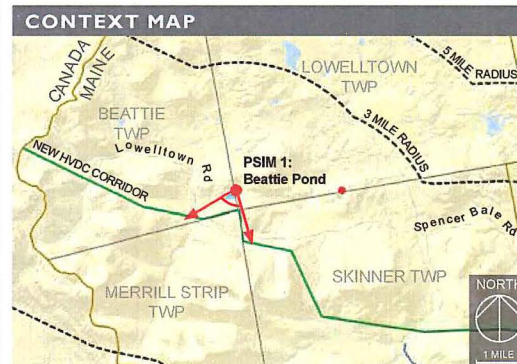
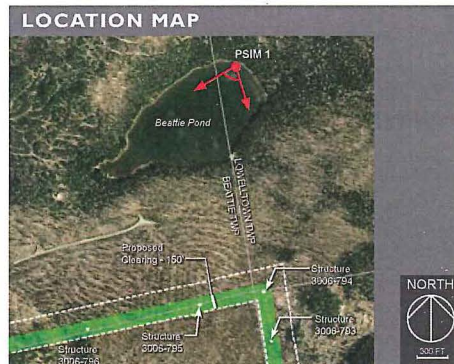
September 22, 2017 PAGE 1 OF 112

Appendix D: Photosimulations

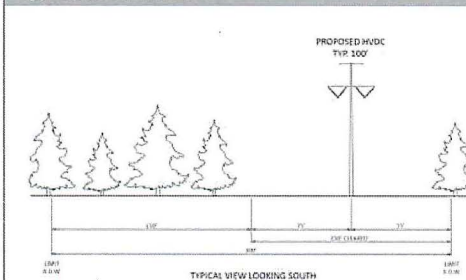
PHOTOSIMULATION I: BEATTIE POND, LOWELLTOWN TWP

January 25, 2019 Proposed Conditions: Panoramic view looking southeast to southwest from the northern end of Beattie Pond toward the proposed HVDC transmission line as revised January 25, 2019. Beattie Pond is a Management Class 6, Remote Pond.

By re-engineering the transmission structures near Beattie Pond, the height of the closest structure (# 3006-794) has been reduced by approximately 39 feet below the structure height shown on the September 2017 original submission (see previous page). While a small portion of the top of the structure will still be visible above the treeline from a few areas on the pond, the structure will not appear above the skyline and will therefore be considerably less visually prominent, if it is noticeable at all. The top of Structure 3006-793 will be seen directly behind Structure 3006-794 from this viewpoint on the pond. Also, as a result of the re-engineering, a smaller portion of Structure 3006-795 will be visible above the treeline. In total, the tops of three HVDC structures and their shield wires will be visible just above the treeline, but will no longer be seen against the sky. The self-weathering steel used for the structures will minimize contrasts with the surrounding wooded hillside. Existing topography and shoreline vegetation will screen the rest of the Project from view. The re-engineered design will result in a reduced overall visual impact from the Pond and, as a result, the Project will be minimally noticeable from recreational users on the pond.

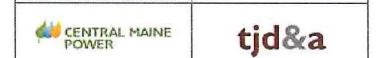
**TECHNICAL INFORMATION**

Typical Cross Section



Photograph / Photosimulation Information

Location	45.503894°, -70.631858°
Viewing Direction	Southeast to Southwest
Horizontal Angle of View	86°
Date and Time	07/26/17 at 12:46 pm
Camera Focal Length	35 mm
Camera Make/Model	Nikon D5500
Photo Source	TJD&A
Proposed Structures Visible	3
Approximate Distance to Nearest Visible Structure	2,283 feet



September 22, 2017

Revised January 25, 2019

Appendix D: Photosimulations

PHOTOSIMULATION 1A: BEATTIE POND, LOWELLTOWN TWP

Existing Conditions: Normal view looking south from Beattie Pond. One existing camp is visible through trees on right in image.

September 22, 2017

PAGE 2 OF 112

Appendix D: Photosimulations

PHOTOSIMULATION 1A: BEATTIE POND, LOWELLTOWN TWP



September 2017 Proposed Conditions: Normal view looking south from Beattie Pond toward the proposed HVDC transmission line. The top of one angle structure and conductors will be visible at a distance of 1,300' +/- from this viewpoint.

The original September 2017 caption incorrectly noted the distance between the closest structure and the viewpoint as 1,300 feet, but that distance is actually the approximate distance between the closest structure and the edge of the pond.

September 22, 2017

PAGE 3 OF 112

Appendix D: Photosimulations

PHOTOSIMULATION 1A: BEATTIE POND, LOWELLTOWN TWP

January 25, 2019 Proposed Conditions: Normal view looking south from Beattie Pond toward the proposed HVDC transmission line. Based on the re-engineered design, the top of two structures (Structures 3006-793 and 3006-794) and shield wires will be visible just above the treeline.

September 22, 2017

*Appendix D: Photosimulations***PHOTOSIMULATION 1A: BEATTIE POND, LOWELLTOWN TWP**

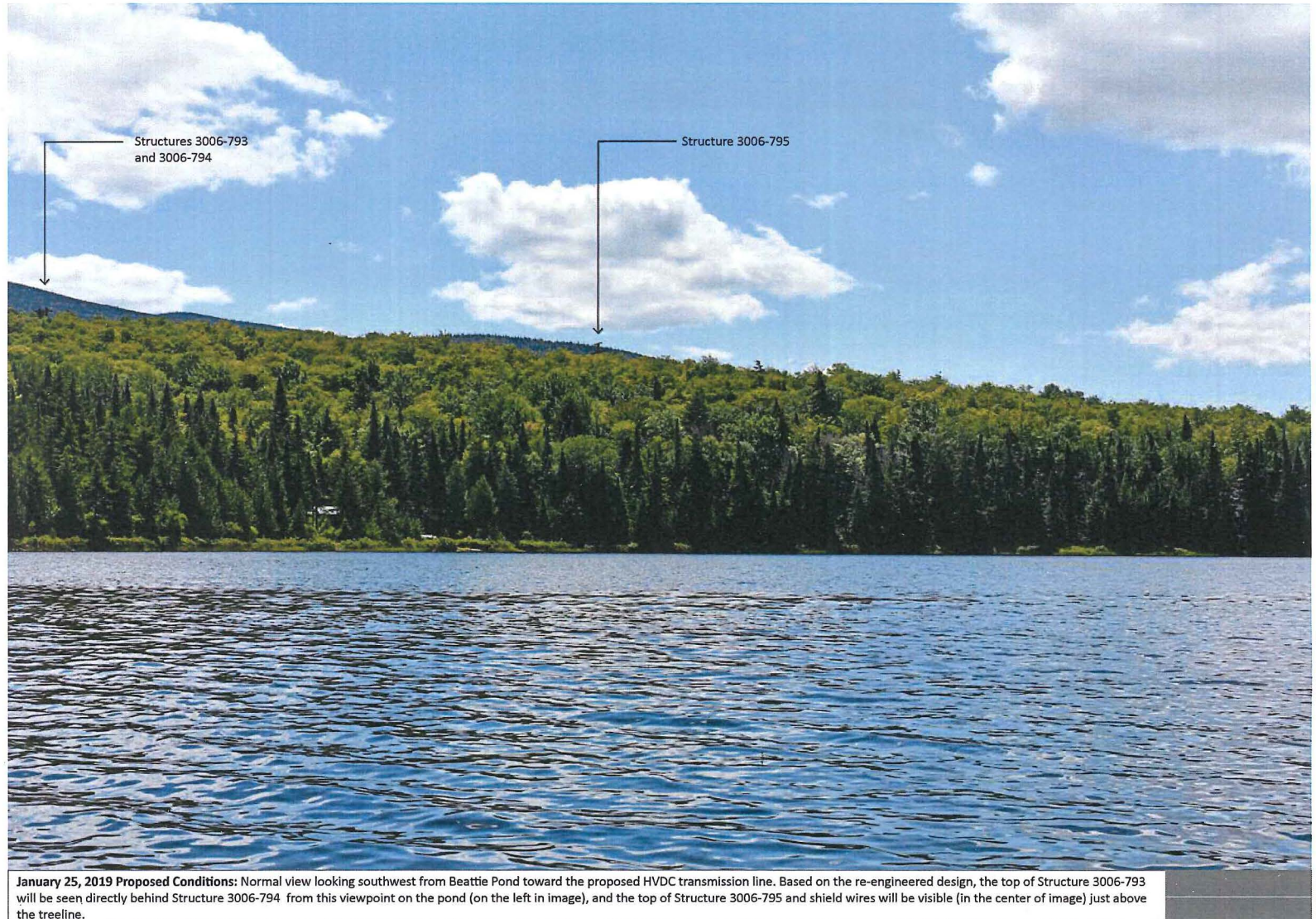
Existing Conditions: Normal view looking southwest from Beattie Pond. One existing camp is visible through trees on left in image.

THIS NORMAL VIEW WAS NOT INCLUDED IN THE ORIGINAL SUBMISSION
January 25, 2019

*Appendix D: Photosimulations***PHOTOSIMULATION 1A: BEATTIE POND, LOWELLTOWN TWP**

January 25, 2019 Proposed Conditions: Normal view looking southwest from Beattie Pond toward the proposed HVDC transmission line. Based on the re-engineered design, the top of Structure 3006-793 will be seen directly behind Structure 3006-794 from this viewpoint on the pond (on the left in image), and the top of Structure 3006-795 and shield wires will be visible (in the center of image) just above the treeline.

Appendix D: Photosimulations

PHOTOSIMULATION 1A: BEATTIE POND, LOWELLTOWN TWP

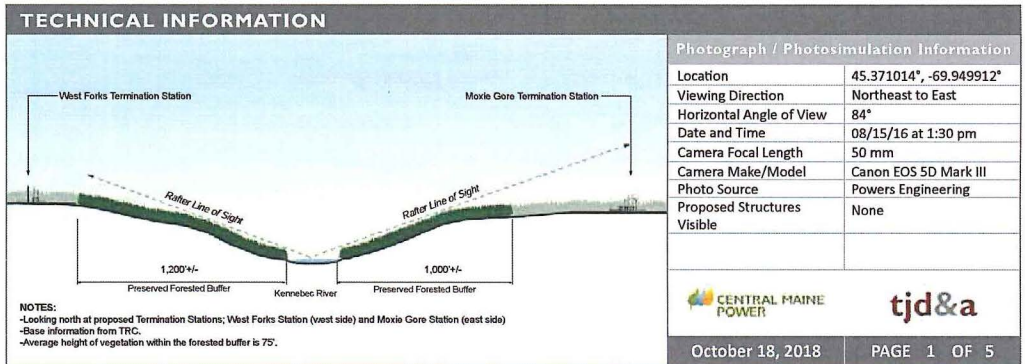
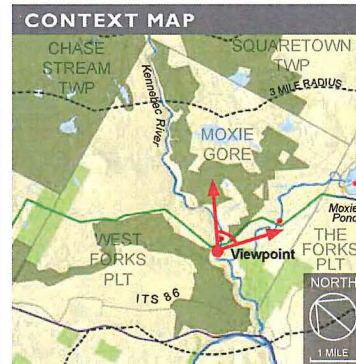
January 25, 2019 Proposed Conditions: Normal view looking southwest from Beattie Pond toward the proposed HVDC transmission line. Based on the re-engineered design, the top of Structure 3006-793 will be seen directly behind Structure 3006-794 from this viewpoint on the pond (on the left in image), and the top of Structure 3006-795 and shield wires will be visible (in the center of image) just above the treeline.

Exhibit 6-1: Photosimulations

MOXIE GORE TERMINATION STATION VISIBILITY EVALUATION **KENNEBEC RIVER, Looking East**



Existing Conditions: Panoramic view looking from north to east from the Kennebec River, approximately 3,600 feet west of the proposed Moxie Gore Termination Station. The Moxie Gore Termination Station will not be visible from the river. A forested buffer of approximately 1,000 in length will be preserved within the corridor between the southeast shoreline and the Station.



MOXIE GORE TERMINATION STATION VISIBILITY EVALUATION
KENNEBEC RIVER, Looking East

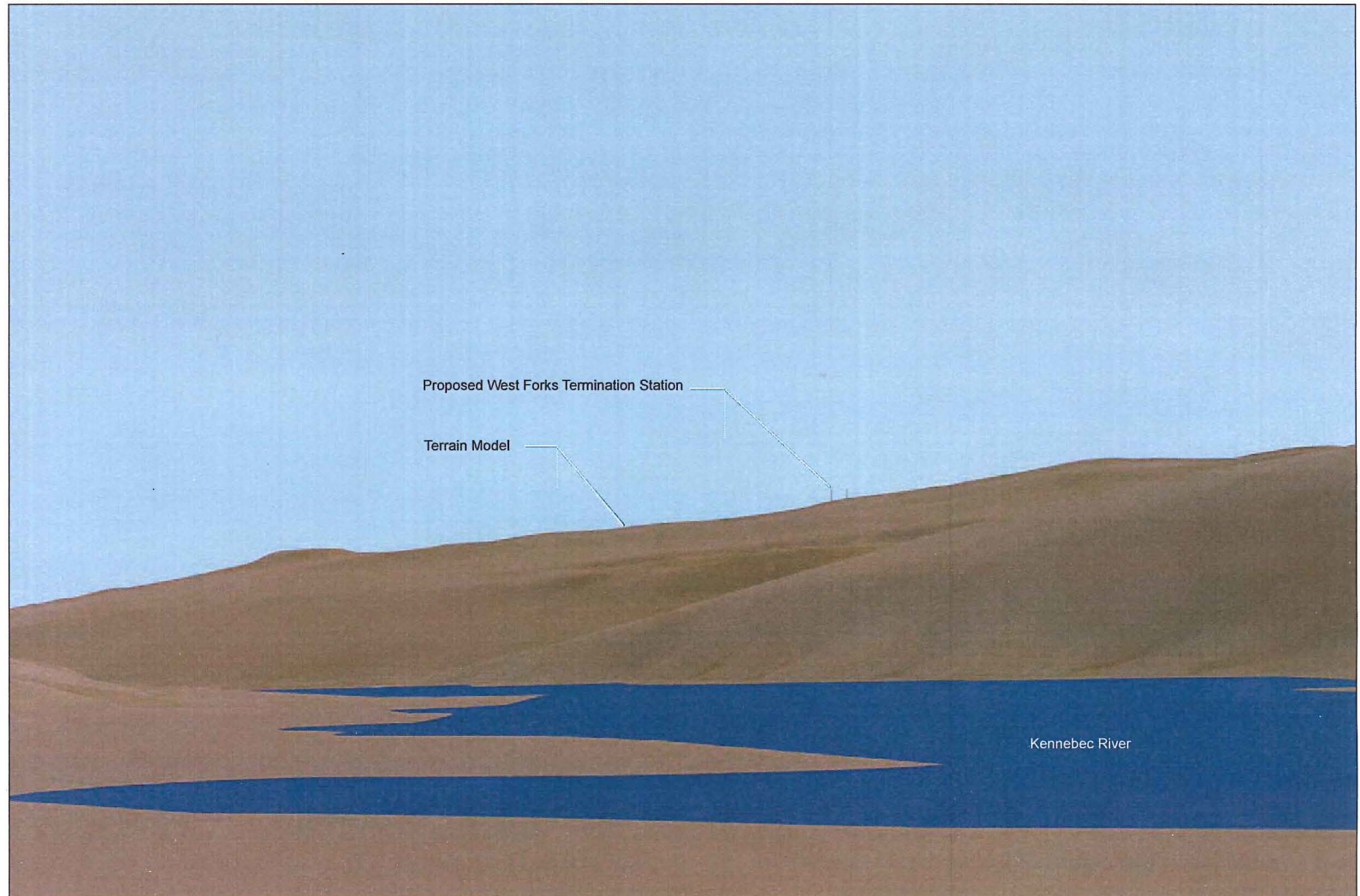


Existing Conditions B: Normal view looking east from the Kennebec River, approximately 3,600 directly west of the proposed Moxie Gore Termination Station

October 18, 2018

PAGE 2 OF 5

MOXIE GORE TERMINATION STATION VISIBILITY EVALUATION
KENNEBEC RIVER, Looking East

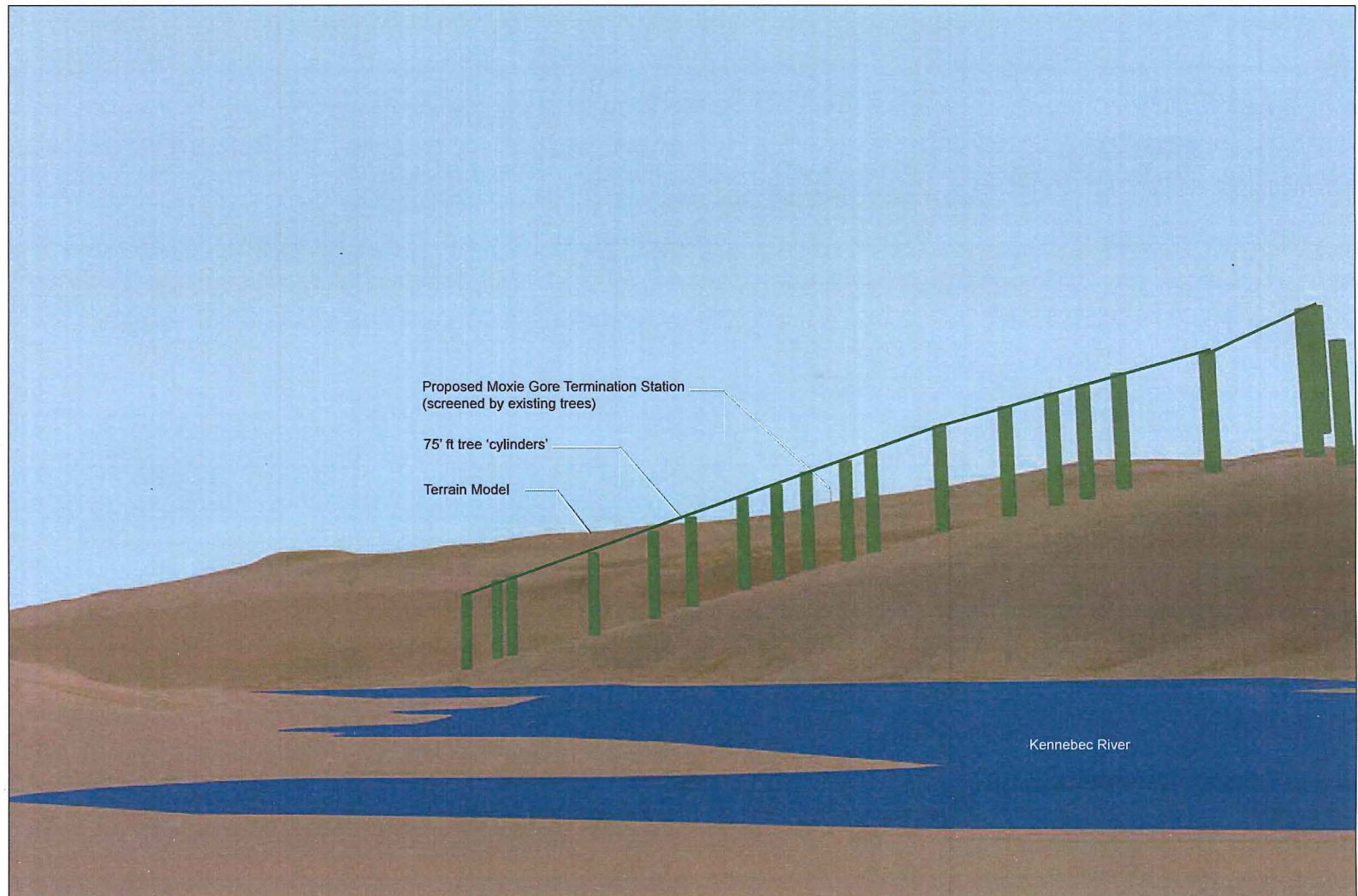


COMPUTER MODEL B-1: This image is generated from a 3D Model developed for the Project and shows the existing terrain when looking from the viewpoint depicted in the Existing Conditions B photograph. Modeling indicates a portion of the proposed Moxie Gore Termination Station would be visible from this location if there was no vegetation on the hillside. The existing terrain would block the lower portion of the Station.

October 18, 2018

PAGE 3 OF 5

MOXIE GORE TERMINATION STATION VISIBILITY EVALUATION
KENNEBEC RIVER, Looking East



COMPUTER MODEL B-2: This image shows green cylinders placed on the terrain model to represent the average tree height of 75 ft as shown on the Existing Conditions B photograph. These tree representations are placed between the river's edge and the clearing limits surrounding the proposed Moxie Gore Termination Station. The modeling indicates that the 75 ft trees will screen the Termination Station from the River.

October 18, 2018

PAGE 4 OF 5

MOXIE GORE TERMINATION STATION VISIBILITY EVALUATION
KENNEBEC RIVER, Looking East



COMPUTER MODEL B-3: This image shows the computer model (terrain and 75' tree cylinders) overlaid and registered with the Existing Conditions photo. The preserved vegetation on the hillside will completely screen the Moxie Gore Termination Station from the Kennebec River.

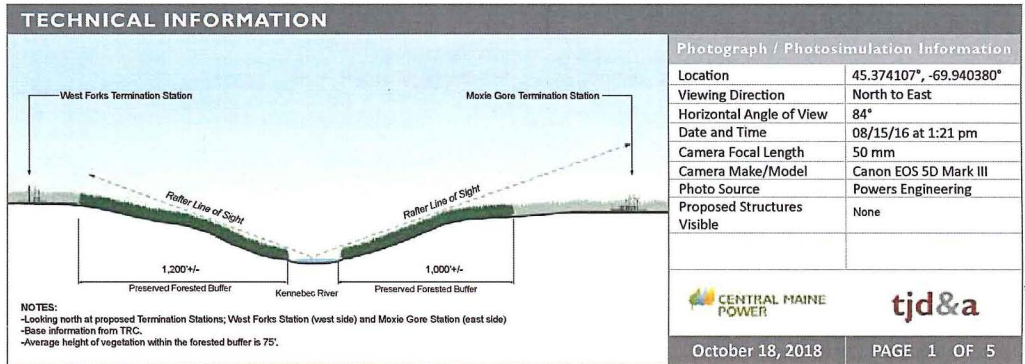
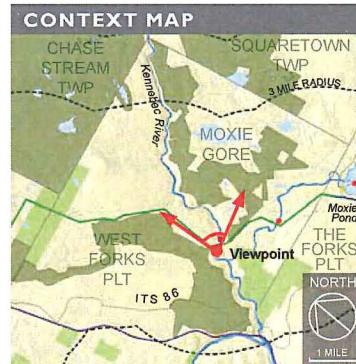
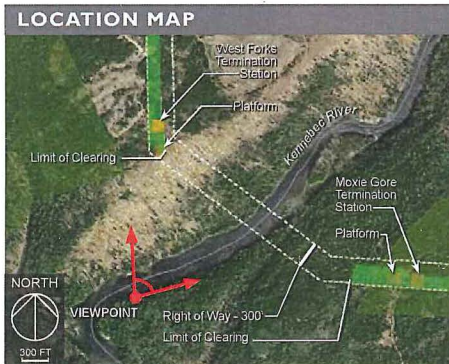
October 18, 2018

PAGE 5 OF 5

WEST FORKS TERMINATION STATION VISIBILITY EVALUATION KENNEBEC RIVER, Looking North



Existing Conditions: Panoramic view looking from north to east from the Kennebec River, approximately 1,900 feet south of the proposed West Forks Termination Station. The West Forks Termination Station will not be visible from the river. A forested buffer of approximately 1,200 in length will be preserved within the corridor between the northwest shoreline and the Station. This photograph was used in the previously submitted Photosimulation 11.



WEST FORKS TERMINATION STATION VISIBILITY EVALUATION
KENNEBEC RIVER, Looking North

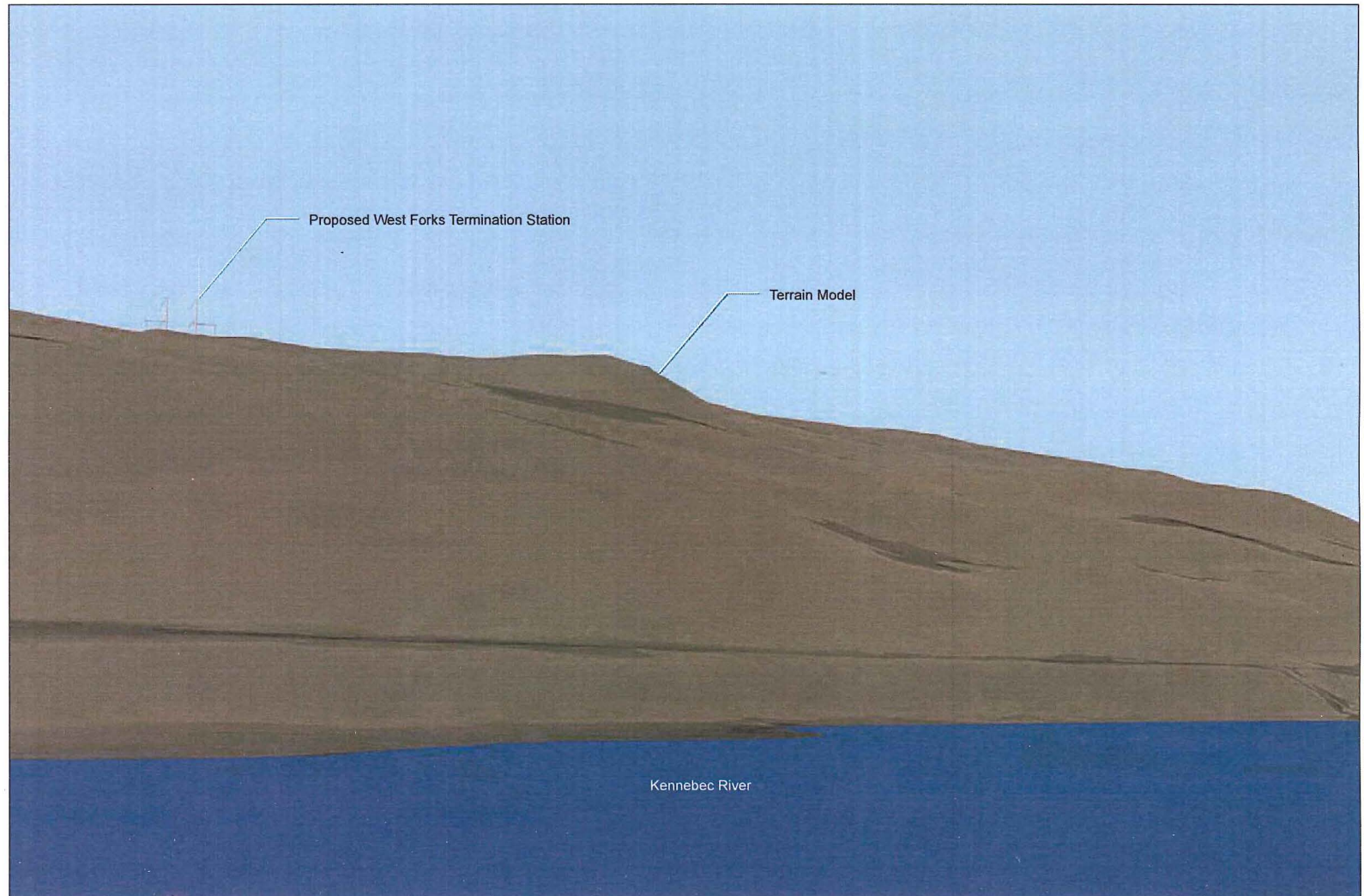


Existing Conditions A: Normal view looking northeast from the Kennebec River, approximately 1,900 directly south of the proposed West Forks Termination Station

October 18, 2018

PAGE 2 OF 5

WEST FORKS TERMINATION STATION VISIBILITY EVALUATION
KENNEBEC RIVER, Looking North

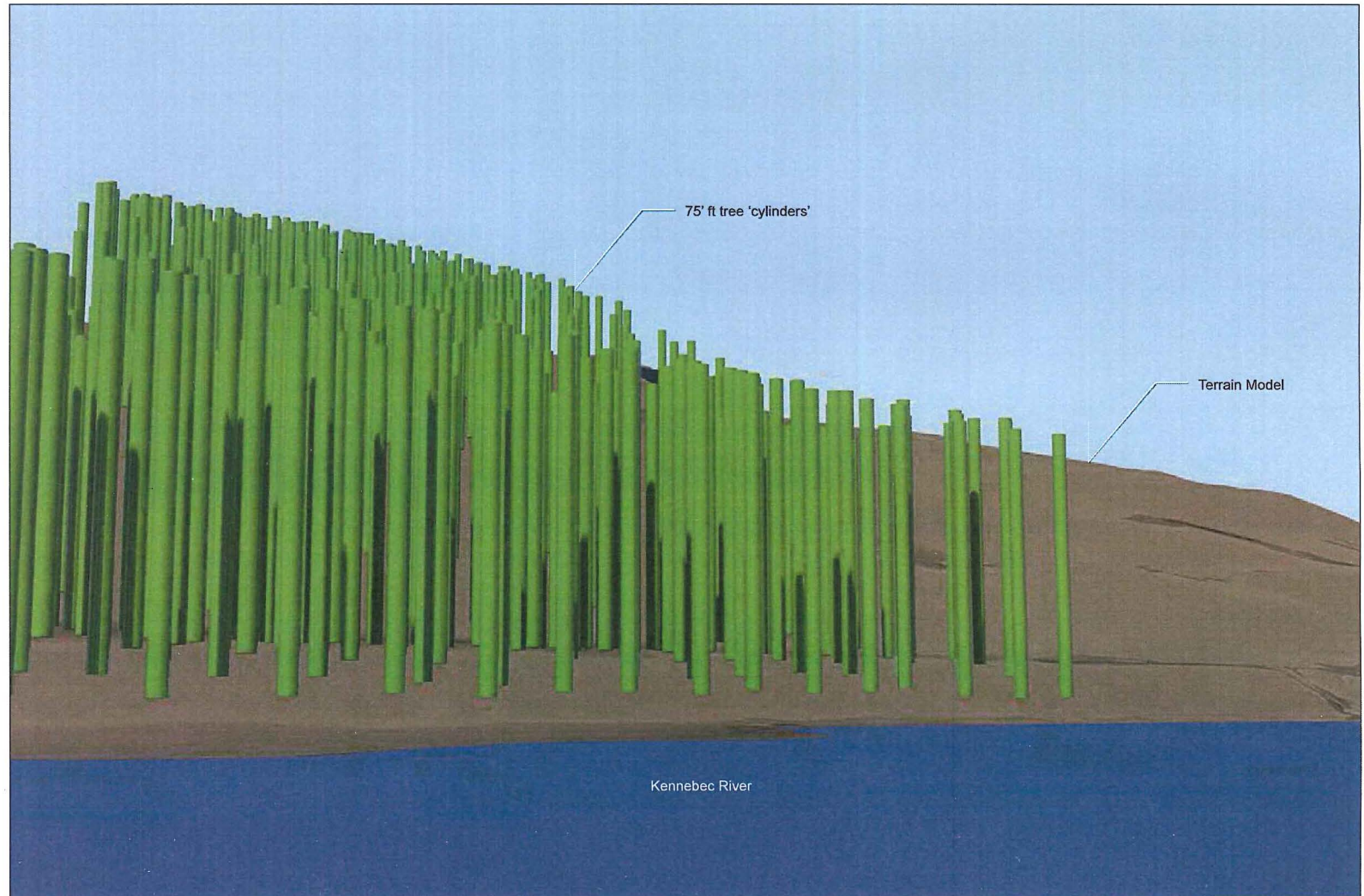


COMPUTER MODEL A-1: This image is generated from a 3D Model developed for the Project and shows the existing terrain when looking from the viewpoint depicted in the Existing Conditions A photograph. Modeling indicates a portion of the proposed West Forks Termination Station would be visible from this location if there was no vegetation on the hillside. The existing terrain would block the lower portion of the Station.

October 18, 2018

PAGE 3 OF 5

WEST FORKS TERMINATION STATION VISIBILITY EVALUATION
KENNEBEC RIVER, Looking North



COMPUTER MODEL A-2: This image shows green cylinders placed on the terrain model to represent the average tree height of 75 ft as shown on the Existing Conditions A photograph. These tree representations are placed between the river's edge and the clearing limits surrounding the proposed West Forks Termination Station. The modeling indicates that the 75 ft trees will screen the Termination Station from the River.

October 18, 2018

PAGE 4 OF 5

**TERMINATION STATIONS VISIBILITY EVALUATION,
KENNEBEC RIVER, Looking North**



COMPUTER MODEL A-3: This image shows the computer model (terrain and 75' tree cylinders) overlaid and registered with the Existing Conditions photo. The preserved vegetation on the hillside will completely screen the West Forks Termination Station from the Kennebec River.

October 18, 2018

PAGE 5 OF 5

PHOTOSIMULATION 3A: ROCK POND, T5 R6 BKP WKR, Revised Structures 731-735

Proposed Conditions: (Revised 12.7.18) Normal view looking northwest from the southeast end of Rock Pond toward the proposed HVDC transmission line. Approximately six structures and conductors will be visible in the partially cleared corridor in the valley between Three Slide and Greenlaw Mountains. A portion of the corridor on Three Slide Mountain will include taller structures and allow full vegetation growth. The remainder of the visible corridor will be maintained with a tapered vegetation management technique to minimize the visual notch affect as viewed from Rock Pond.

December 4, 2017

PAGE 6 OF 8

Revised December 7, 2018

STATE OF MAINE
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY)
NEW ENGLAND CLEAN ENERGY CONNECT)
#L-27625-26-A-N/#L-27625-TG-B-N/)
#L-27625-2C-C-N/#L-27625-VP-D-N/)
#L-27625-IW-E-N)

CENTRAL MAINE POWER COMPANY)
NEW ENGLAND CLEAN ENERGY CONNECT)
SITE LAW CERTIFICATION SLC-9)
Beattie Twp, Merrill Strip Twp, Lowelltown Twp,)
Skinner Twp, Appleton Twp, T5 R7 BKP WKR,)
Hobbs town Twp, Bradstreet Twp,)
Parlin Pond Twp, Johnson Mountain Twp,)
West Forks Plt, Moxie Gore,)
The Forks Plt, Bald Mountain Twp, Concord Twp)

PRE-FILED DIRECT TESTIMONY AND EXHIBITS OF
MARK GOODWIN

Regarding

- Project Overview
- Issue 1: Scenic Character and Existing Uses
- Issue 2: Wildlife Habitat and Fisheries
- Issue 4: Compensation and Mitigation

February 28, 2019

I. Qualifications of Witness (Relevant to DEP and LUPC Review)

My name is Mark Goodwin and I am a Senior Environmental Scientist at Burns & McDonnell Engineering Company, Inc. ("Burns & McDonnell"). My curriculum vitae is

attached hereto as Exhibit CMP-3-A. I have been working on behalf of Central Maine Power Company (“CMP”) as Environmental Project Manager associated with permitting support for the New England Clean Energy Connect Project (“NECEC” or “Project”) since April of 2017.

My principal role on the NECEC permitting team consists of managing the development and submittal of the state and federal permit applications, supplemental application materials, and responses to agency information requests. Additionally, I have coordinated meetings and interfaced with regulatory staff on behalf of CMP to discuss avoidance, minimization, and compensation for unavoidable impacts on protected natural resources. I am thoroughly familiar with the NECEC Project design, plans, and documentation submitted in support of the applications, including the natural resource avoidance and mitigation measures, unavoidable natural resource impacts, and the compensation proposed for those impacts.

I have been an environmental professional for 20 years, working with a variety of clients primarily within the electrical transmission and natural gas pipeline industries. I obtained a Bachelor of Science in Natural Resources, with a concentration in Resource Economics and Environmental Policy, from the University of Maine in 1998, and became a Certified Professional in Erosion and Sediment Control (“CPESC”) in 2005.

From 1998 to 2009, I was employed by Northern Ecological Associates, Inc. (now Tetra Tech, Inc.) in Portland, Maine as an environmental scientist. In that role, my responsibilities included wetlands delineation, wildlife and aquatic surveys, habitat assessments, regulatory assessments, National Environmental Policy Act (“NEPA”) report preparation, Section 7 Endangered Species Act (“ESA”) consultation, and state, federal, and local permitting, primarily for linear energy development projects. In addition, I provided regulatory compliance services for clients during the construction of their projects. I also provided third party environmental

compliance inspection services for the Federal Energy Regulatory Commission (“FERC”) and the Massachusetts Department of Environmental Protection on natural gas pipeline projects, and for the Maine Department of Environmental Protection (“DEP”) on an electric transmission line project.

In 2009, I joined Burns & McDonnell in Portland, Maine where I was the environmental permitting and compliance manager as part of the program management team on CMP’s Maine Power Reliability Program (“MPRP”) project. In that role, my responsibilities included managing the construction phase regulatory compliance effort, which entailed construction compliance inspection; coordination of project variances and preparation of the associated permit modification applications; and interaction with local, state, and federal regulatory staff. In that capacity, I also managed the municipal permitting effort, developed multiple interactive environmental training programs, and trained over 5,000 workers.

Since the completion of the MPRP in 2015, I have assisted with permitting and compliance on a number of energy development projects across the northeast and mid-Atlantic for a variety of clients in the electric, natural gas, and wind power industries. In addition, I assisted the City of Bangor, Maine with state and federal permitting for a coal tar remediation project in the Penobscot River, including literature review and evaluation of impacts to Atlantic salmon and Atlantic and shortnose sturgeon and preparation of a draft Not Likely to Adversely Affect letter in support of the Section 7 ESA consultation and the Department of the Army permit for the project.

II. Purpose and Scope of Testimony (Relevant to DEP and LUPC Review)

The purpose of my testimony is to discuss buffering for visual impacts; impacts to state-listed Roaring Brook Mayfly and Northern Spring Salamander, brook trout habitat, habitat

fragmentation, and cold water fisheries; and the adequacy of compensation and mitigation for unavoidable impacts to cold water fisheries habitat, outstanding river segments, and wetlands.

III. Summary of Testimony (Relevant to DEP and LUPC Review)

CMP has made adequate provision for buffering for visual impacts and the Project has been located, designed, and landscaped to minimize visual impact on the surrounding area such that it will neither adversely affect nor unreasonably interfere with scenic character. CMP also has made adequate provision for the protection of wildlife habitat and fisheries, specifically that the Project will not unreasonably harm habitats of the state-listed threatened Roaring Brook Mayfly or the species of special concern Northern Spring Salamander, brook trout, and coldwater fisheries, nor will it result in unreasonable habitat fragmentation. The Project avoids and minimizes impacts to these resources and provides adequate compensation for those impacts to cold water fisheries habitat, outstanding river segments, and wetlands that cannot be avoided, to achieve no net loss of habitat functions and values.

IV. Discussion

a. Project Overview

i. Project Description (Relevant to DEP and LUPC Review)

I hereby adopt the project description provided in the direct testimony of Gerry Mirabile as if it were my own.

ii. Project Purpose and Need (Relevant to DEP and LUPC Review)

I hereby adopt the project purpose and need description provided in the direct testimony of Gerry Mirabile as if it were my own.

b. Issue 1 (Scenic Character and Existing Uses)

i. Buffering for Visual Impacts (Relevant to DEP and LUPC Review)

The NECEC project components include transmission line poles and conductors, as well as electric substation, termination station, and converter station facilities (collectively referred to as “substations”). CMP sited the NECEC project components to fit the development into the existing natural environment by using existing transmission line corridors as well as natural buffers, topography, and existing vegetation to minimize visibility from scenic and natural resources.

Approximately 91.8 miles of the Project’s 145.3 miles of HVDC line corridor, and approximately 139.5 miles of the total 193 miles of transmission line corridor, are sited in existing transmission line corridors and average only about 75 feet of widening of existing corridors, thereby minimizing visual impact of the new HVDC line. Substations are proposed in areas where similar infrastructure already exists or is otherwise screened from adjacent uses by topography and/or intervening vegetation. Through the visual impact analysis performed by Terrence J. DeWan and Associates, Inc. (“TJDA”), CMP determined that mitigation in the form of buffer plantings is appropriate to buffer (1) one substation, Fickett Road Substation, from adjacent uses along Fickett Road in Pownal and (2) the Project from users on Moxie Stream in Moxie Gore. These visual buffer planting plans were submitted to the DEP and LUPC on August 13, 2018. Additionally, mitigation in the form of buffer planting plans was determined to be necessary to buffer the Project from users of Route 201 in Moscow and Johnson Mountain Twp (Old Canada Road Scenic Byway). These buffer planting plans were submitted to the DEP and LUPC on December 8, 2018. It should be noted that since the submission of the buffer planting plan for Moxie Stream, CMP has agreed to allow taller vegetation to persist for distances of 269

and 296 feet, respectively, for the purpose of maintaining deer travel corridors on either side of Moxie Stream. This will further minimize views of the corridor in this area.

No lighting is proposed within the transmission line corridor. Substations will include perimeter lighting, control house and converter building lighting, and work lights. The control house, converter building, and perimeter lighting will use full cut-off luminaires to reduce light spillage. The work lights will be flood-type luminaires, but only operated for maintenance or emergencies.

Furthermore, CMP proposes to cross beneath the upper Kennebec River, an Outstanding River segment, using horizontal directional drilling (“HDD”) to eliminate views from the river’s scenic and recreational uses. The corridor as designed minimizes visibility from Route 201, a scenic byway, by siting the line perpendicular to the road to minimize the duration of visibility for motorists, and by siting the corridor on the west side of Johnson Mountain in a topographic depression on Coburn Mountain to eliminate visibility for motorists.

CMP also proposed to shorten a structure closest to Beattie Pond, a Management Class 6 remote pond in Beattie Township, to minimize visibility from recreational users of the LUPC’s P-RR subdistrict.

The transmission line components of the Project will consist of weathered steel or wooden poles and will have electric conductor that over a period of years will weather to a matte finish. This will reduce the contrast in color of the transmission line components, thereby buffering the view from adjacent uses. The transmission line will be primarily co-located with existing corridors and, in the case of the new corridor, will be sited in an area that has been dominated by industrial scale timber harvesting for over 100 years, resulting in an ever-changing mosaic of successional growth patterns across the landscape. Users of this area are aware of and

expect to see these constantly evolving visual changes to the landscape. The transmission line will fit visually with existing uses in both the co-located and new corridor portions of the Project.

Additionally, to maintain required minimum operational safety clearances, vegetation within the corridor will be managed to ensure that it generally does not grow taller than ten feet. Natural buffering between the corridor and abutting properties, consisting primarily of native scrub-shrub non-capable species (i.e., species not capable of growing greater than ten feet in height), will be maintained. Areas that are cleared of capable species will typically become characterized by this same scrub-shrub environment. Trees within the right-of-way will be cut using logging equipment, but all roots, other than those located in areas that require excavation, will be left intact in order to hold the soil. Soil disturbance and grading will be minimized through careful planning of temporary access ways. When the temporary access ways are removed, the disturbed areas will be restored to their pre-construction grade and allowed to revegetate. Except for the areas immediately around the base of each transmission line structure, the full width and length of the transmission corridor will remain vegetated following construction of the Project. CMP also proposed a vegetation management practice of tapered vegetation to buffer the view of the transmission line corridor from Coburn Mountain and Rock Pond.

These construction and vegetation management practices are included in CMP's Site Law application, Exhibit 10-1 New England Clean Energy Connect Plan for Protection of Sensitive Natural Resources During Initial Vegetation Clearing ("VCP") and Exhibit 10-2 New England Clean Energy Connect Post-Construction Vegetation Management Plan ("VMP") (updated January 30, 2019). They will shield adjacent uses, minimize the visual impact of the Project to the

fullest extent possible, and will result in a transmission line corridor that will fit harmoniously into the existing natural environment.

ii. Buffering Specific to the P-RR Subdistrict (Relevant to LUPC Review)

Approximately 71.7 miles of NECEC corridor are located within the LUPC's jurisdiction. Utility facilities like the HVDC transmission line are an allowed use in each of the LUPC subdistricts crossed, including those by special exception for utility facilities, i.e., the Recreation Protection Subdistrict ("P-RR").

P-RR subdistricts are those areas identified by the LUPC that provide or support unusually significant primitive recreation opportunities. The special exception criteria for utility facilities in the P-RR subdistrict require the applicant to show that the use can be buffered from other uses or resources within the subdistrict. The HVDC transmission line corridor crosses the P-RR subdistrict in three locations: near Beattie Pond in Beattie Twp; at the Upper Kennebec River between Moxie Gore and West Forks Plt; and at the Appalachian Trail ("AT") in Bald Mountain Twp, as further described below and discussed by CMP witnesses Terrence DeWan and Amy Segal.

Beattie Pond is classified as a Management Class VI Lake, also referred to as a Remote Pond. The P-RR subdistrict associated with Beattie Pond encompasses a ½-mile buffer from the normal high-water mark of the waterbody (Exhibit CMP-3-B). Portions of the P-RR subdistrict are located in Beattie Twp, Lowelltown Twp, Skinner Twp, and Merrill Strip Twp. The proposed development is located within ¼-mile of the high-water mark of Beattie Pond within the P-RR subdistrict. As stated in the Site Law application and further explained by CMP witness Brian Berube, CMP attempted to negotiate an alternative alignment south of the Beattie Pond P-RR subdistrict through Merrill Strip Twp, but was unable to come to mutually-acceptable terms with

the landowner. Re-routing north of the pond to avoid the P-RR subdistrict would result in approximately two miles of additional corridor and associated vegetation clearing and would lead to potentially higher visibility from the pond due to the higher elevations associated with Caswell Mountain. Neither alternative route is suitable for the proposed use, or reasonably available to CMP. Views of the Project from uses on Beattie Pond originally included one transmission line structure. CMP submitted an application modification to the DEP and LUPC on January 25, 2019 that, at the request of the LUPC staff, reduced the height of this structure to further buffer the Project from Beattie Pond.

The P-RR subdistrict at the upper Kennebec River extends for a distance of 250 feet from the normal high-water mark on both sides of the river (Exhibit CMP-3-C). The original project design at this location included an overhead transmission line crossing of the river with no transmission line structures being placed in the P-RR subdistrict. In addition, CMP agreed to maintain forested buffers on both sides of the river to minimize visual impacts to users on the river. CMP amended its proposal on October 19, 2018 to incorporate an underground as opposed to overhead crossing of the river, using HDD technology. As a result, forested buffers on both sides of the river have been expanded to 1,450 feet and 1,160 feet, respectively, and there are no views of transmission line structures or overhead conductors or of either termination station from the P-RR subdistrict.

The NECEC Project crosses the P-RR subdistrict in three locations on the AT adjacent to Moxie Pond and Trestle Road in Bald Mountain Twp. These crossings occur in an existing CMP corridor, which already contains a 115kV transmission line (Exhibit CMP-3-D). The P-RR subdistrict in this location includes a 200-foot-wide strip centered over the AT. The configuration of the trail, within and adjacent to an approximately 3,500-foot-long portion of

existing transmission line corridor, prevented CMP from avoiding direct impacts to the subdistrict. As a result, one of five transmission line structures in this portion of the Project corridor is located within the P-RR subdistrict. Alternative alignments of the Project would result in crossings of the AT in one or more locations where there are no existing transmission line corridors. Co-location of the HVDC transmission line within the existing transmission line corridor therefore minimizes visual impacts to users in the P-RR subdistrict. In addition, CMP reduced structure heights along the length of Moxie Pond to further minimize visual impacts from viewpoints from the AT on the summits of Pleasant Pond Mountain and Bald Mountain and from Moxie Pond.

As of March 2014, there were 56 electric transmission line crossings of 230 kilovolts (kV) or more along the length of the AT, equating to one 230kV transmission line crossing for every 38 miles of trail length¹. The portion of the AT located in Maine is crossed by five (5) 115kV transmission lines. Because hikers are aware of and expect to see utility corridors, and the Project has been co-located in existing corridor, there will be a negligible change in the visual impact of transmission line poles and overhead conductors to hikers using the trail. However, the visual impact assessment completed by TJDA concluded that open views of the corridor from the Appalachian Trail at Troutdale Road justified mitigation in the form of a buffer planting plan. CMP prepared a plan that buffers views of the project and submitted it to the DEP and LUPC on August 13, 2018.

¹ Argonne National Laboratory. 2014. Electricity Transmission, Pipelines, and National Trails: An Analysis of Current and Potential Intersections on Federal Lands in the Eastern United States, Alaska, and Hawaii. Prepared for the United States Department of Energy, Office of Electricity Delivery and Energy Reliability, Washington, D.C.

iii. Issue 1 Conclusion (Relevant to DEP and LUPC Review)

It is my opinion that the development will not adversely affect scenic character; CMP has made adequate provision for buffering for visual impacts. The Project has been located, designed, and landscaped to minimize its visual impact to the fullest extent possible, and the Project provides for the preservation of existing elements of the development site which contribute to the maintenance of scenic character.

Where the Project is located within the P-RR subdistrict, it will be sufficiently buffered from other uses and resources to meet the LUPC's special exception criteria.

c. Issue 2 (Wildlife Habitat and Fisheries)

On behalf of CMP, Burns & McDonnell consulted with the Maine Department of Inland Fisheries and Wildlife ("MDIFW") and requested that MDIFW conduct a project review and provide existing data on wildlife and fisheries resources, including the identification of significant habitats, rare or listed species, and significant communities that may be present on or within the impact area. CMP met extensively with the MDIFW to discuss the Project's effect on endangered species, brook trout habitat, habitat fragmentation, and buffer strips around cold water fisheries; avoidance of impacts to wildlife and fisheries; and compensation for unavoidable impacts (discussed in the next section). Through this consultation and by careful evaluation of Project impacts, CMP developed proposed avoidance, mitigation, and compensation to address those impacts.

i. Endangered Species – Roaring Brook Mayfly, Spring Salamanders (Relevant to DEP Review)

MDIFW identified the presence of Roaring Brook Mayfly, a state threatened species, and the likely presence of Northern Spring Salamander, a special concern species, within the NECEC Project area in its March 15, 2018 environmental permit review letter to DEP Project Manager

James Beyer. It should be noted that species of “special concern” are not protected under the Maine Endangered Species Act (“Maine ESA”), but are administrative categories established by policy for planning and information purposes.

To protect these species, MDIFW recommended a 250-foot riparian management zone for all streams draining slopes above 1,000 feet elevation mean sea level with coarse substrates and bordered by relatively undisturbed mixed or hardwood forest. As allowed by MDIFW, CMP alternatively chose to conduct field survey for these species in streams meeting these habitat preferences within the NECEC corridor from the Maine/Quebec border through Johnson Mountain Twp. Burns & McDonnell evaluated all perennial water bodies within the survey area and submitted a subset of these water bodies (75 streams), including stream characterizations developed through evaluation of the original natural resource survey field data forms, to the MDIFW on August 7, 2018.

Upon its review of the data provided, MDIFW eliminated 34 streams from consideration due to inadequate habitat conditions for Roaring Brook Mayfly and Northern Spring Salamander. Environmental scientists from Burns & McDonnell, accompanied by MDIFW-recommended (Exhibit CMP-3-E) entomologist Marcia Siebenmann and herpetologist Trevor Persons, conducted the field survey effort during the weeks of September 10-14 and September 17-21, 2018 and submitted the results of the survey to MDIFW on October 19, 2018. Further evaluation of laboratory samples by entomologist Dr. Steve Burian at the Southern Connecticut State University confirmed the presence of Roaring Brook Mayfly in two of the water bodies, Mountain Brook and Gold Brook, surveyed. Samples from the South Branch of the Moose River could not be positively identified, however MDIFW determined that for this waterbody Roaring Brook Mayfly should be considered present. Eleven of the water bodies surveyed confirmed the

presence of Northern Spring Salamander. In addition, a number of water bodies located outside of CMP's 300-foot wide corridor but within 250 feet of the proposed clearing limits, meeting the aforementioned habitat parameters, were not surveyed due to a lack of survey permission from the landowner. In these instances, CMP assumed presence of Roaring Brook Mayfly and Northern Spring Salamander.

Following the completion of the presence/absence surveys, MDIFW informed CMP that it considered two locations, Mountain Brook in Johnson Mountain Twp and Gold Brook in Appleton Twp, to be ecologically significant. Accordingly, and upon consultation with MDIFW, CMP revised its proposal to incorporate taller structures and avoid clearing by allowing full height canopy within the 250-foot riparian management zone for Mountain Brook and Gold Brook as shown in Exhibit CMP-3-F. For all other streams with presence of Northern Spring Salamander and/or Roaring Brook Mayfly, assumed or known, MDIFW agreed that CMP's vegetation management practices and a contribution to the Maine Endangered and Non-game Wildlife Fund would adequately protect the habitat and species.

ii. Brook Trout Habitat (Relevant to DEP Review)

Of the 743 waterbodies located within the NECEC corridor, 223 have been identified by the MDIFW as containing brook trout (*Salvelinus fontinalis*). Brook trout are pervasive in the Project area and found in some portion of many of the water bodies within that area. The brook trout populations in some of these streams are natural and self-supporting, particularly those associated with the smaller, colder streams that are sustained by groundwater input.

Potential indirect impacts to brook trout habitat include sedimentation and turbidity, introduction of pollutants, and stream insolation. A study by N.C. Gleason² on the impacts of power line rights-of-way (“ROW”) on forested stream habitat found that despite the open canopy condition, water temperatures were slightly lower than in off-ROW areas and that none of the water quality parameters was significantly different between the on-ROW and off-ROW study areas. Gleason’s study also found no correlation between percent canopy cover and mean percentage of fines and found no significant difference in the Benthic Index of Biotic Integrity scores between on-ROW and upstream areas.

With the exception of culvert removals and replacements intended to improve habitat quality and connectivity proposed as part of CMP’s Compensation Plan, the Project will have no direct impact (i.e., in-stream construction) on brook trout habitat. All equipment crossings are temporary, completely span each stream, and will be constructed and maintained in a manner that will prevent sediment from entering water bodies. Additionally, CMP will follow its *Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects* (Site Law application Exhibit 14-1), provided in the Basic Standards Submission Section of the Site Law application, which contains effective and proven erosion and sedimentation control best management practices that will be used to protect soil and water resources during construction of the various NECEC Project components.

To minimize the potential adverse impact to water quality from spills, no fuel storage, refueling, vehicle parking, or vehicle maintenance will be performed within 100 feet of protected wetlands or water bodies, unless no practicable alternative exists and sufficient secondary containment is provided. CMP will also implement its *Environmental Control Requirements for*

² Gleason, N.C. 2008. Impacts of Power Line Rights-of-Way on Forested Stream Habitat in Western Washington. Environmental Symposium in Rights-of-Way Management, 8th International Symposium, pages 665-678.

Contractors and Subcontractors - Oil and Hazardous Material Contingency Plan (Site Law application Exhibit 15-1), which establishes minimum requirements for effective spill prevention, response, and reporting.

Sun exposure on smaller water bodies can result in a negative impact due to an increase in water temperature (insolation), which can pose problems for cold water fisheries. A.M. Peterson³ has reported that the removal of tree canopy (on new transmission line corridors) increases stream insolation during the short term, but within two years the areas are bordered by dense shrubs and emergent vegetation and water temperatures are not significantly higher than upstream forested reaches. Similarly, Peterson found that stream reaches in electric transmission ROWs were exposed to more light, had denser stream bank vegetation, were deeper and narrower, and had a greater area composed of pools. Peterson's study found that trout were more abundant in stream reaches within ROWs and concluded that the increase in incident sunshine resulted in a denser forb and shrub root mass, which further stabilized stream banks, resulting in less stream bank erosion, deeper channels, and higher populations of trout.

CMP's vegetation maintenance will be implemented on a four-year cycle following the initial clearing effort, which encourages the dense forb and shrub root mass found by Peterson to minimize impacts to trout and sustain a viable trout population.

iii. Habitat Fragmentation (Relevant to DEP Review)

CMP minimized and avoided habitat fragmentation impacts in several ways including co-locating the majority of the transmission line components within existing corridors and locating the remainder of the transmission line components primarily within areas already subject to intensive industrial forestry practices; implementing vegetation management practices that are

³ Peterson, A.M. 1993. Effects of Electric Transmission Rights-of-Way on Trout in Forested Headwater Streams in New York. *North American Journal of Fisheries Management*, vol. 13 pp. 581-585.

wildlife friendly and promote early successional habitat throughout its corridors; and allowing for taller vegetative growth to be maintained in select locations of the NECEC ROW to address species-specific concerns.

Co-location of energy infrastructure is a primary consideration when minimizing impacts to existing land uses and the environment. The proposed development minimizes habitat fragmentation in this manner by utilizing existing transmission line corridors for approximately 73% of the Project. CMP's siting strategy was to identify a corridor that utilized the greatest amount of existing transmission line corridor with the least amount of environmental impact. CMP, through its alternatives analysis that is discussed in detail by CMP witnesses Gerry Mirabile, Brian Berube, Amy Segal, and Terrance DeWan, identified the proposed route consisting of existing transmission line corridor between Lewiston and the northern terminus of Lake Moxie and the portion of new corridor located between the northern terminus of Lake Moxie to the Maine/Quebec border, a "working forest" that is routinely disturbed by forestry activities, as the preferred alternative.

CMP manages vegetation within its line corridors consistent with techniques promoted as part of a 2016 Memorandum of Understanding ("MOU")⁴ between the Environmental Protection Agency ("EPA"), Edison Electric Institute, U.S. Department of Agriculture (specifically, the Forest Service), and U.S. Department of the Interior (specifically, the Bureau of Land Management, Fish and Wildlife Service, and National Park Service). Integrated vegetation management ("IVM") practices have been adopted by federal agencies as the best practices standard within utility rights-of-way. IVM promotes the development of early successional growth and resists the growth of vegetation into taller strata (trees) through the application of

⁴ EPA et al. 2016. Memorandum of Understanding on Vegetation Management for Powerline Rights-of-Way. 14pp.

environmentally friendly manual, mechanical, and chemical treatments on a four-year maintenance cycle. IVM is recognized as a practice that reduces impacts on land, water, habitat and wildlife while meeting the goals of providing reliable and safe electrical service.

According to the EPA⁵, “the IVM approach can create natural, diverse, and sustaining ecosystems, such as a meadow transition habitat. These transition landscapes, in turn, reduce wildlife habitat fragmentation and allow species to be geographically diverse, remaining in areas from which they might otherwise be excluded. A variety of wildlife species (including threatened and endangered species) consider these habitats home, such as butterflies, songbirds, small mammals, and deer. These habitats also encourage the growth of native plant species and can increase plant diversity.” IVM optimizes wildlife habitat potential and produces a soft edge effect which lessens the impact of fragmentation⁶.

CMP’s vegetation management practices will avoid the hard edge impact generally associated with habitat fragmentation and negative impacts on species resiliency by creating a soft edge that maintains landscape permeability and establishes areas of dense shrubby vegetation and taller vegetation where topographic conditions allow (e.g., steep ravines), thereby providing a vegetation bridge for wildlife movement across the NECEC corridor. Further, CMP’s vegetation management practices require riparian buffers, ranging from 75 to 100 feet in width measured from the top of bank, to be maintained at all stream crossings in a manner that will allow taller non-capable vegetation to persist, promoting the movement of wildlife across the corridor and increasing habitat connectivity in these areas.

⁵ <https://www.epa.gov/pesp/benefits-integrated-vegetation-management-ivm-rights-way#benefit>

⁶ Bramble, W.C., and W.R. Byrnes. 1996. Integrated vegetation management of an electric utility right-of-way ecosystem. *Down to Earth* 51(1):29–34.

CMP's proposed development will not create a "hard" edge, i.e., the change in habitat is primarily restricted to a change in vegetation cover type from forested to scrub-shrub, as opposed to the permanent removal of habitat (e.g., roads and impervious surfaces associated residential and commercial developments). An evaluation of vernal pool habitat by TRC Engineers, LLC (TRC), based on an extensive survey of over 620 miles of electric transmission corridor on the MPRP project (Exhibit 1-7 of the Compensation Plan, revised January 30, 2019), found that habitat conditions permeable to amphibian migration, including the presence of leaf litter, coarse woody debris, mammal burrows, and dense herbaceous and shrub vegetation cover, were present in CMP's transmission corridors. CMP's construction and vegetation management practices proposed for the NECEC Project will encourage early successional growth supporting these permeable habitat conditions.

TRC's evaluation concluded that "no measurable loss of vernal pool functions is apparent in and along electric utility transmission corridors; in fact, significant vernal pools remain abundant and highly productive in the typical scrub/shrub habitat found in most transmission line corridors, even after multiple decades." Although the Project will not create an urbanized environment, according to Windmiller and Calhoun⁷ vernal pool wildlife species are known to exhibit some resistance and resilience even to urbanization. This acknowledgment, in addition to the hundreds, if not thousands, of functioning vernal pools located within CMP corridors, supports the conclusion that the "soft" development associated with the Project will not unreasonably impact vernal pools through habitat fragmentation.

The impact of habitat fragmentation on vernal pools is further mitigated by the fact that the majority of vernal pools, significant or otherwise, within the Project ROW are located within

⁷ Windmiller, Bryan & J. K. Calhoun, Aram. (2007). 12 Conserving Vernal Pool Wildlife in Urbanizing Landscapes. 10.1201/9781420005394.ch12.

1,000 feet of another vernal pool. As described by the USACE 2016 New England District Compensatory Mitigation Guidance, clusters of vernal pools that vary in size, hydroperiod, and spatial proximity provide each resident species with a variety of potential breeding sites.

In addition to the minimization and avoidance of habitat fragmentation through co-location and IVM practices, CMP has incorporated allowances for taller vegetation to persist in select locations to address habitat fragmentation concerns identified through consultation with MDIFW. These include: deer travel corridors in the biologically significant Upper Kennebec Deer Wintering Area (“DWA”) and in Rusty Blackbird habitat in Johnson Mountain Twp./Parlin Pond Twp. Through consultation with the MDIFW, CMP developed a series of ten (10) deer travel corridors (Exhibit CMP-3-G), ranging in size from 247 to 1,450 linear feet, that will allow taller trees to persist in the ROW to promote habitat connectivity and minimize fragmentation of the Upper Kennebec DWA. Also, through consultation with MDIFW, CMP proposes to allow softwoods up to 15 feet in height to grow within the ROW in locations where it overlaps Rusty Blackbird habitat (Exhibit CMP-3-H).

iv. Buffer Strips Around Cold Water Fisheries (Relevant to DEP Review)

The construction and vegetation management practices described in Exhibit 10-1 VCP and Exhibit 10-2 VMP of CMP’s September 27, 2017 Site Law application establish protections for stream buffers within the NECEC Project area. Riparian natural buffers or stream buffers were expanded from CMP’s initial proposal in September 2017. In a meeting held between CMP, DEP, and MDIFW on January 22, 2019, DEP recommended that for CMP to adequately protect cold water fisheries, protections of riparian buffers for vegetation management and maintenance activities should be expanded to 100 feet for cold water fishery habitats, outstanding river segments, threatened or endangered species water bodies, and all perennial streams in the

new corridor portion (Segment 1) of the Project. For all other water bodies, DEP recommended an expanded buffer of 75 feet. Based on this guidance, CMP incorporated these changes into Exhibit 10-1 VCP and Exhibit 10-2 VMP of CMP's amended Site Law application, filed with the DEP on January 30, 2019. The following is a summary of the restrictions and protections for work in riparian buffers as provided in amended Exhibits 10-1 and 10-2.

Prior to initial clearing for construction stream buffers will be flagged with unique flagging so contractors can distinguish between the applicable 75-foot or 100-foot stream buffer and apply the appropriate protections and restrictions. Flagging will be maintained throughout construction. CMP will avoid placing any transmission structures within the stream buffers, unless specifically authorized by DEP and accompanied by a site specific erosion and sediment control plan. No structures will be placed within 25 feet of any stream regardless of classification. Additionally, CMP will use erosion and sedimentation control practices described in its *Environmental Guidelines for Construction and Maintenance Activities on Transmission Line and Substation Projects* (Site Law application Exhibit 14-1).

To protect water quality, during construction and during post-construction vegetation maintenance, foliar herbicides will be prohibited within the applicable stream buffers and there will be no refueling/maintenance of equipment in these areas unless it occurs on a paved road or if adequate secondary containment is used with oversight from an environmental inspector.

To minimize ground disturbance and limit the potential for erosion and sedimentation, initial clearing efforts will be performed during frozen ground conditions whenever practicable, and, if not practicable, the recommendations of the environmental inspector will be followed regarding the appropriate techniques to minimize disturbance, such as the use of selectively placed travel lanes within the stream buffer. Removal of capable species or dead or hazard trees

within the stream buffer will typically be accomplished by hand-cutting, but the use of mechanized equipment is allowed if supported by construction matting or during frozen conditions in a manner (i.e., use of travel lanes and reach-in techniques) that preserves non-capable vegetation less than 10 feet in height to the greatest extent possible.

Prior to routine vegetation maintenance of the transmission corridors, which is typically conducted on a 4-year cycle, all buffers will be flagged with unique flagging to distinguish between their applicable buffers, 75 feet or 100 feet. Within that portion of the stream buffer that is within the wire zone (i.e., within 15 feet, horizontally, of any conductor) all woody vegetation over 10 feet in height, whether capable or non-capable, will be cut back to ground level (Exhibit CMP-3-I). Resulting slash will be removed within 50 feet of the stream and managed in accordance with the Maine Slash Law. No other vegetation will be removed, other than dead or hazard trees. Removal of capable species within the stream buffers will be accomplished by hand cutting only. Mechanized equipment will not be used.

Allowing non-capable vegetation to remain as described within the appropriate buffer will provide shading and reduce the warming effect of direct sunlight (insolation). Low ground cover will also remain within these buffers to filter any sediment or other pollutants in surface runoff. These restrictions will allow the stream buffers to provide functions and values similar to those prior to transmission line construction.

As discussed in my testimony on habitat fragmentation above, the maintenance of these buffers will provide adequate space for movement of wildlife between important habitats. The expansion of CMP's original buffer proposals, to further ensure protection of cold water fisheries (as determined by DEP and MDIFW), accompanied by the restrictions and protections described above, provide that no unreasonable harm will occur to cold water fisheries.

v. Issue 2 Conclusion (Relevant to DEP Review)

For the foregoing reasons, it is my opinion that there will be no unreasonable disturbance to or unreasonable impact on the Roaring Brook Mayfly, Northern Spring Salamanders, or Brook Trout habitat, and the Project will not result in unreasonable habitat fragmentation. Alteration of such habitat and disturbance of such wildlife has been kept to the minimum amount necessary, and the Project does not unreasonably degrade such habitat, unreasonably disturb such wildlife, or unreasonably affect the continued use of the site by such wildlife. CMP has made adequate provision for buffer strips around cold water fisheries.

d. Issue 4 (Compensation and Mitigation)

CMP's Compensation Plan achieves a no-net-loss of ecological functions and values through a combination of: use of the In-Lieu-Fee ("ILF") Program by the DEP and the U.S. Army Corps of Engineers ("USACE") as a compensatory mitigation option for permit applicants; preservation of regionally significant natural resources; and implementation of a number of wildlife habitat enhancement projects. This Plan meets, and in the case of compensation for wetlands and other impact types, exceeds the applicable compensation requirements, as demonstrated further below. For reference, Exhibit CMP-3-J includes the summary tables provided in the Compensation Plan.

i. Cold Water Fisheries Habitat (Relevant to DEP Review)

The DEP noted in its December 12, 2017 Environmental Information Request that the mitigation package should compensate for impacts to cold water fisheries (and recreational uses of the outstanding river segments) and that "The Department envisions this mitigation package will be the responsibility of CMP to implement, not simply providing ILF monies." As such,

CMP has proposed a variety of mitigation and compensation measures in its Compensation Plan, submitted on January 30, 2019.

As previously discussed in this testimony, CMP incorporated adequate protections by expanding buffers to 100 feet for the cold water fishery resources, so the Project will not result in an unreasonable disturbance of this habitat.

Nonetheless, in a January 22, 2019 meeting DEP and MDIFW asked CMP to quantify linear miles of streams within the Project that will be subject to forested conversion and evaluate the indirect impact to these resources. The Plan, as described below, is robust and addresses the various requests made by the agencies to compensate for the indirect impact of forest conversion of riparian areas within the NECEC ROW.

The NECEC will have 11.02 linear miles of streams that will be subject to forested conversion impact; this includes all streams regardless of classification or value. While the DEP did not offer specific guidance or compensation ratios, the Compensation Plan offers a comprehensive package with a variety of mitigation and compensation measures, as previously recommended by DEP:

1. Preservation of 12.02 linear miles of stream contained within the Grand Falls Tract, Lower Enchanted Tract, and Basin Tract, which is greater than a 1:1 ratio.
2. A contribution of \$180,000 to the Maine Endangered and Nongame Wildlife Fund to protect cold water fishery habitat. The contribution amount was based on the estimated labor cost to implement “chop and drop,” a cold water fisheries habitat enhancement and mitigation proposal on perennial streams in the new corridor portion of the Project (Segment 1). “Chop and drop,” which refers to the implementation of the Maine Forest Service Rule Chapter 25 “Standard for Placing Wood into Stream Channels to Enhance

Cold water Fisheries Habitat,” was removed from the Compensation Plan at the request of MDIFW and replaced with the fee contribution. The contribution that replaced the “chop and drop” was included to offset the partial loss of coarse woody debris resulting from tree clearing in riparian areas.

3. Implementation of the Culvert Replacement Program, which includes the repair, removal, or replacement of culverts within CMP-controlled lands as well as \$200,000 of funding to replace culverts on lands outside CMP’s ownership. The intent of the culvert replacement program is to provide habitat enhancement and connectivity for cold water fisheries to offset lost functions and values of these resources, however minor.

ii. Outstanding River Segments (Relevant to DEP Review)

The NECEC crosses five locations that are protected as outstanding river segments:

- Upper Kennebec River
- Kennebec River below Wyman Dam
- Carrabassett River
- Sandy River
- West Branch of the Sheepscot River

CMP proposes to cross under the upper Kennebec River using HDD to preserve the aesthetic value of this river segment. Crossing beneath the Kennebec River will eliminate views of any NECEC Project components from recreational and other river users.

In the other four outstanding river locations, CMP minimized impact by co-locating the HVDC line within existing rights-of-way. By utilizing existing rights-of-way, CMP minimized additional clearing to an average width of 75 feet, and minimized additional natural resources impacts by proposing crossing in locations where developed transmission line corridors exist.

Additionally, in response to MDIFW's environmental review comments (submitted July 13, 2018), CMP committed to retaining 100-foot riparian buffers at all outstanding river segments.

Because approximately 425 linear feet, or 850 feet of outstanding river frontage (on each bank), will be permanently impacted by forest conversion during construction of the NECEC, CMP's Compensation Plan also includes land preservation of three tracts along the Dead River which collectively will add 1,053.5 acres to Maine's conserved lands and provide protection in perpetuity for 7.9 miles of river frontage along the Dead River, an outstanding river segment. In addition to the wealth of recreational opportunities (which include hiking, fishing, whitewater rafting, canoeing, snowmobiling, wildlife viewing, and hunting), these tracts include the protection of Grand Falls waterfall, the largest horseshoe waterfall in the State, in perpetuity.

Impacts to outstanding river segments will not unreasonably impact existing recreational uses of these rivers, and the preservation value of the parcels along the Dead River far exceeds the 850 feet of river frontage that will be impacted by the Project.

iii. Wetlands (Relevant to DEP Review)

CMP first sought to avoid and then minimize impacts to wetlands where practicable through a thorough alternatives analysis and engineering design. Unavoidable fill will result from structures, soil mounding associated with pole placement, and, where necessary, concrete foundations. The area of disturbance for each pole varies based on structure type. Installations will range from approximately 30 to 185 square feet of permanent fill per structure, depending on structure type (e.g., steel monopole or wood H-frame). Following installation, the areas around each pole will naturally revegetate to herbaceous or shrub wetland communities. The small loss of wetland area from the structure fill equates to a negligible loss of wetland functions

and values relative to the remaining wetland area at each structure site. Impacts from transmission line structures will have a de minimis permanent impact to wetlands.

The Merrill Road Converter Station, Fickett Road Substation, and HDD termination stations will have permanent wetland impacts from fill of approximately 3.130 acres, 1.328 acres, and 0.259 acres, respectively. Permanent fill impact from transmission line structures total approximately 0.150 acre.

Wetlands within the NECEC Project area were classified as either wetlands that are not of special significance or as wetlands of special significance (“WOSS”). Habitats reviewed to determine freshwater WOSS include:

- mapped habitats for state and federally listed threatened and endangered species;
- high and moderate value inland waterfowl and wading bird habitat (“IWWH”);
- presence of significant vernal pool habitat (“SVPH”);
- areas within 250 feet of a great pond;
- wetland containing more than 20,000 square feet of open water or aquatic or emergent marsh;
- areas located within a flood plain;
- areas designated as a peatland; or
- areas located within 25 feet of a river stream or brook.

Of the 4.868 acres of permanent wetland fill, fill in non-WOSS and WOSS wetlands totals 0.307 acre and 4.561 acres, respectively. The 4.561 acres of direct fill in WOSS include wetland areas in SVPH and IWWH. CMP’s Compensation Plan proposes to use the preservation of lands of comparable habitat to compensate for permanent fill within wetlands. For wetlands

within SVPH and IWWH, CMP's Plan proposes using the ILF. Permanent fill in WOSS, excluding SVPH and IWWH, is 3.814 acres.

For impacts that require compensation by both DEP and USACE, such as direct wetland fill, CMP used the higher USACE ratio of 20:1 in determining the appropriate compensation. In fact, the NECEC Compensation Plan offers a ratio of 30:1 for permanent fill in wetlands, which exceeds the 8:1 ratio required by the DEP and the 20:1 ratio required by the USACE for land preservation. When applying 30:1 to both WOSS (excluding SVPH and IWWH) and non-WOSS, this yielded a total preservation amount of 123.65 acres. The three proposed preservation parcels -- Flagstaff Lake Tract, Little Jimmie Pond-Harwood Tract , and Pooler Pond Tract -- contain 510.75 acres of wetland, a portion of which will be used to offset the 4.122 acres of permanent fill in wetlands.

For wetlands within SVPH and IWWH, CMP's Plan proposes using the ILF. Direct impacts to IWWH will total approximately 0.017 acre (747 square feet). Of the 0.017 acre, 0.003 acre (149 square feet) is wetland and 0.014 acre (598 square feet) is upland. Consistent with the ILF Program guidance for WOSS, CMP proposes to compensate for the unavoidable impacts to wetland areas in IWWH using 100% compensation and a resource multiplier of two. The fee for wetlands within IWWH was calculated using the Natural Resource Enhancement & Restoration Cost and the average assessed land value per square foot of impact. Thus, the fee proposed to compensate to permanent wetland fill in IWWH is \$1,165.18.

Direct impacts to SVPH total approximately 1.463 acres. Of the 1.463 acres, 0.743 acre is wetland and 0.720 acre is upland areas. Wetland areas in SVPH are defined as WOSS and, consistent with the ILF Program, CMP proposes to compensate for the unavoidable impacts to wetland areas in SVPH using 100% compensation and a resource multiplier of two. The fee for

wetlands within SVPH was calculated using the Natural Resource Enhancement & Restoration Cost and the average assessed land value per square foot of impact. Thus, the fee proposed to compensate to Permanent Wetland Fill in SVPH is \$224,669.00.

In summary, 123.65 acres of wetland preservation of comparable habitat types was calculated at a ratio of 30:1, significantly more than 8:1 ratio required by the DEP. The ILF for permanent wetland fill in IWWH and SVPH was calculated using the ILF Program's wetland compensation formula for WOSS (resource multiplier of two). CMP's Compensation Plan exceeds the compensation requirements for wetlands under NRPA.

iv. Issue 4 Conclusion (Relevant to DEP Review)

It is my opinion that CMP's compensation and mitigation measures fully address all impacts that cannot be avoided to cold water fisheries, outstanding river segments, and wetlands.

V. Conclusion (Relevant to DEP and LUPC Review)

The Project will not adversely affect scenic character and has been sited to fit with existing uses, i.e., within existing transmission line corridors and in areas that undergo an ongoing pattern of timber harvesting. In P-RR zones the Project avoids and minimizes visual impact and has been sufficiently buffered from existing uses and resources to meet the LUPC's special exception criteria.

The Project will not unreasonably harm the Roaring Brook Mayfly, Northern Spring Salamander, or brook trout habitat and adequate provision has been provided for buffer strips around cold water fisheries. Similarly, CMP's vegetation management practices provide adequate provision for the maintenance of wildlife travel lanes and connectivity of adjacent habitats; are consistent with techniques promoted by the EPA and other federal agencies to

minimize impacts to wildlife and habitat; and, will not result in unreasonable disturbance or harm resulting from habitat fragmentation.

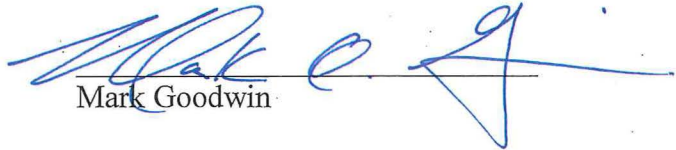
The Project has been designed and sited in a manner that avoids and minimizes impacts to the greatest extent possible and, where impacts are unavoidable, has proposed mitigation measures and provided a robust and comprehensive compensation plan, which not only accounts for lost functions and values, but exceeds the requirements under NRPA.

Exhibits:

- CMP-3-A: Goodwin CV
- CMP-3-B: LUPC P-RR Beattie Pond Figure
- CMP 3-C: LUPC P-RR Upper Kennebec River Figure
- CMP-3-D: LUPC P-RR AT Moxie Pond Figure
- CMP-3-E: MDIFW Recommendations for Entomologist and Herpetologist
- CMP-3-F: Gold Brook and Mountain Brook Figures
- CMP-3-G: Kennebec DWA Travel Corridor Figure
- CMP-3-H: Rusty Blackbird Habitat Figure
- CMP-3-I: Typical HVDC Tangent Vegetation Maintenance Figure
- CMP-3-J: Compensation Plan Summary Tables

Dated: 2.27.2019

Respectfully submitted,


Mark GoodwinSTATE OF MAINE
CUMBERLAND, ss.
COUNTY

The above-named Mark Goodwin did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Dated: 2/27/19

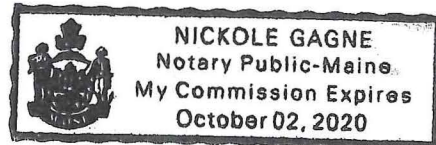
Before,



Notary Public

Name: NICKOLE GAGNE

My Commission Expires:



MARK A. GOODWIN, CPESC

Senior Environmental Scientist



Mr. Goodwin serves Burns & McDonnell as a senior environmental scientist. He has extensive experience in all phases of energy development projects, from environmental field surveys, environmental assessment, alternatives analysis, permitting, environmental training, and environmental compliance inspection, to post-construction monitoring and mitigation. As such, he possesses an extensive knowledge of the process of project planning, permitting, and

construction, as well as a thorough understanding of the implications of regulatory requirements on construction activities.

A summary of his experience is provided below.

EDUCATION

- ▶ B.S., Natural Resources, University of Maine, 1998

REGISTRATIONS

- ▶ Certified Professional Erosion & Sediment Control (CPESC)
- ▶ DEP Certification in Erosion & Sediment Control Practices (ME)
- ▶ OSHA 30-Hour Certification

9 YEARS WITH BURNS & MCDONNELL

20 YEARS OF EXPERIENCE

New England Clean Energy Connect Project | Central Maine Power Company ME | April 2017-Present

Environmental Project Manager Mr. Goodwin was responsible for managing a team of environmental scientists, permitting specialists, noise specialists, archeologists, visual impact specialists, geologists, and GIS specialists and coordinating the preparation of permit applications to the Maine Department of Environmental Protection, Maine Land Use Planning Commission, and the United States Army Corps of Engineers for this high-voltage direct current transmission line project which includes approximately 200 miles of transmission line and associated facilities. In addition, Mr. Goodwin managed and assisted with the preparation of the environmental portions of the Presidential Permit application submitted to the United States Department of Energy. Mr. Goodwin facilitated multiple meetings with the regulatory agencies and was a subject matter expert at three public informational meetings. Mr. Goodwin continues to provide Central Maine Power Company with post-filing support during the agency review period.

Section 388/3023 Replacement Project – Phase I | Maine Electric Power Company ME | July 2016-January 2017

Environmental Manager Mr. Goodwin coordinated a series of agency consultation meetings with the Maine Department of Environmental Protection to determine the applicability of the Site Location of Development Act Law for the reconstruction of 55 miles of 345kV transmission line. Additionally, Mr. Goodwin was responsible for completing the federal permitting for this project.

Darnestown Substation Project | Potomac Electric Power Company MD | January 2016-September 2016

Environmental Project Manager Mr. Goodwin was responsible for coordinating with project management and engineering to identify the deliverables and information needed to prepare and submit applications to the Department of Permitting Services in Montgomery County, Maryland for the construction of an electric substation. Mr. Goodwin applied for and received building permits and right-of-way permits for the project.



MARK A. GOODWIN, CPESC

(continued)

Bangor Landing Coal Tar Capping Project | City of Bangor, Maine ME | June 2016-October 2016

Senior Environmental Scientist Mr. Goodwin performed a regulatory analysis to determine the permitting required to construct a non-aqueous phase liquid (NAPL) trapping cap over coal tar contaminated sediments in the Penobscot River associated with historic manufactured gas plant operation. Mr. Goodwin consulted with the National Marine Fisheries Service and the Army Corps of Engineers and researched and drafted a Not Likely to Adversely Affect (NLAA) letter in support of the project.

Jericho Rise Wind Farm Project | EDP Renewables, NA NY | February 2016-May 2018

Project Manager Mr. Goodwin's project management duties included the development of the construction environmental monitoring manual, compliance implementation training program, archeological awareness and unanticipated discovery plan, and compliance site assessments during the construction of this 37 turbine wind farm in upstate New York. Mr. Goodwin presented the initial environmental training program prior to the start of construction of this project.

Access Northeast Project | Spectra Energy| Algonquin Pipeline NY, CT, MA | August 2015

Subject Matter Expert Mr. Goodwin assisted Spectra Energy during landowner informational meetings and the FERC open house meetings in support of the FERC pre-filing process for this pipeline and LNG storage infrastructure expansion project designed to support natural gas-fired electrical generation in New England. Mr. Goodwin provided project information to stakeholders from the public during these meetings including route identification and responded to questions specific to construction practices and environmental impacts as a subject matter expert.

Maine Power Reliability Program/T&D Project | Central Maine Power Company ME | October 2009-December 2015

Environmental Project Manager Mr. Goodwin served as environmental project manager. His responsibilities included managing the local permitting effort for more than 70 municipalities as well as managing the construction phase regulatory compliance effort during construction of this electric reliability program consisting of over 350 miles of transmission line and multiple substation development sites. In this role, he participated in numerous public meetings and organized and coordinated multiple meetings with agency personnel. Mr. Goodwin coordinated with numerous outside consultants and managed the preparation and QA/QC of state and federal permit modification applications. He also managed the variance process for the approval of post-permit project design modifications. He was responsible for coordinating the compliance effort with the contractor's environmental representatives, Maine Department of Environmental Protection (DEP) staff and inspection personnel, and local codes enforcement officers during construction. He also developed multiple interactive environmental training programs and trained over 5,000 workers on the Program.



MARK A. GOODWIN, CPESC

(continued)

Southern York County System Reinforcement and Section 219/220 Rebuild Projects | Central Maine Power Company/Tetra Tech Inc. (formerly Northern Ecological Associates Inc.)*

ME | September 2007-March 2008

Environmental Inspector Mr. Goodwin served as an environmental inspector. He provided third party environmental inspection for the Maine DEP on a 10-mile 115-kV electric transmission line project. He managed the Maine DEP third party inspection effort on two electric transmission rebuild projects.

Jewel Ridge Pipeline Lateral Project | Duke Energy (Spectra)*

VA | May 2006-August 2006

Environmental Inspector Mr. Goodwin served as an environmental inspector. He acted as a FERC third party environmental compliance monitor. He assisted FERC and USFWS with developing innovative strategies for erosion and sediment control in mountainous terrain.

Petal Gas Storage 100-Line and Cavern 3 and 8 Storage Field | El Paso Corporation*

MS | April 2004

Wetlands Delineation/Permitting Support Mr. Goodwin performed wetland and waterbody surveys. He prepared the FERC wetland and wildlife resource reports, the biological assessment, and he performed the NPDES permitting for a natural gas storage cavern project.

Third Party Technical Review of Notices of Intent Submitted by Weaver's Cove Energy, LLC, and Mill River Pipeline, LLC | Town of Somerset Conservation Commission*

MA | May 2004-September 2004

Third Party Technical Reviewer Mr. Goodwin served as a third-party technical reviewer. He prepared a comprehensive regulatory review of Notices of Intent filed under the Massachusetts Wetlands Protection Act. The regulatory review assessed whether the applicant had met the performance standards required and included an assessment of impacts and proposed mitigation. He provided the results of the technical review at multiple public hearings with the conservation commission.

Stony Brook Natural Gas Pipeline Project | Massachusetts Municipal Wholesale Electric Company*

MA | May 2002-July 2002

Environmental Inspector Mr. Goodwin served as an environmental inspector. He was a Massachusetts DEP third party environmental compliance monitor. He prepared an invasive species eradication and control program for the project. He prepared a planting plan as mitigation for unavoidable tree loss along the project corridor.

Londonderry 20-inch Replacement Project | Tennessee Gas Pipeline Company NH and MA | April 2001-September 2001

Environmental Compliance Inspector/Field Coordinator/Report Manager Mr. Goodwin served as an environmental compliance inspector/field coordinator/report manager. He performed inspection, reports, and field coordination for a comprehensive Turbidity Monitoring Program along a 19.3-mile pipeline replacement project. His responsibilities included

MARK A. GOODWIN, CPESC

(continued)

preparing and providing reports to the local conservation commissions, conducting rare plant species surveys, removal, and post-construction transplantation, and performing post-construction wetlands and waterbody restoration assessments.

Portland Natural Gas Transmission System (PNGTS) and PNGTS/Maritimes & Northeast Joint Facilities*

ME, NH, MA | July 1998 – December 1998

Environmental Inspector Mr. Goodwin served as an environmental inspector. He conducted waterbody crossing inspections and turbidity monitoring during construction, post-construction wetland assessments, and he prepared the wetlands monitoring report submitted to state and federal agencies.

**denotes experience prior to joining Burns & McDonnell*





Legend

CMP Ownership / Easement Extent	LUPC Zone p-fp	p-rr; p-rr200
Project Centerline	p-fw	p-sg
Proposed Structures	d-gn	p-sl1; p-sl2
Town Boundary	p-gp	p-wl1; p-wl1ow;
	d-rs	p-wl2; p-wl3
	p-ma	

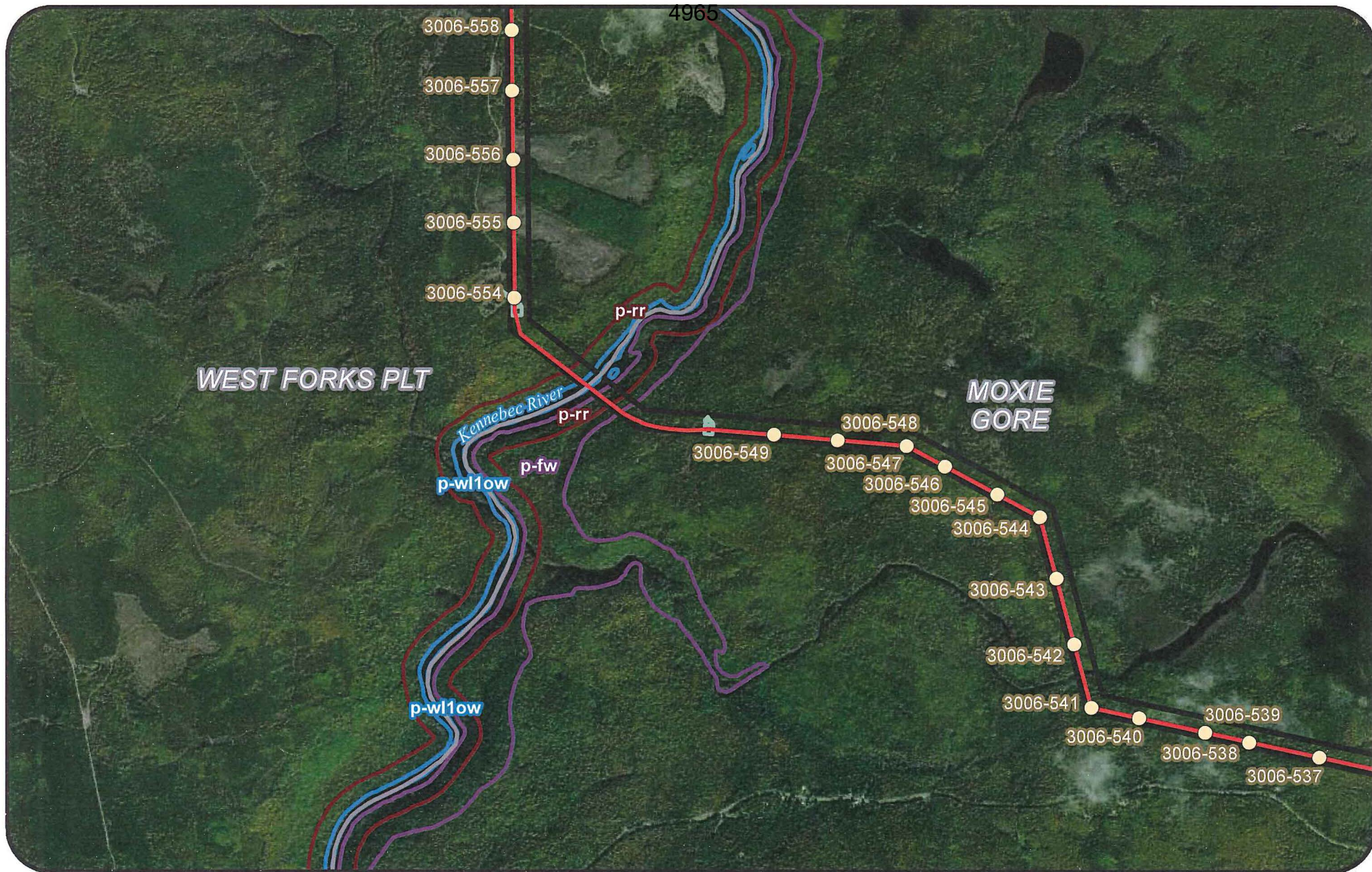
New England Clean Energy Connect

Figure 25-1 Beattie Pond

1,000
Feet



CMP-3-B



Legend

- CMP Ownership / Easement Extent
- Project Centerline
- Proposed Structures
- Town Boundary

LUPC Zone

- p-wl1; p-wl1ow; p-wl2; p-wl3
- p-rr
- p-fw

- HDD Station LOD



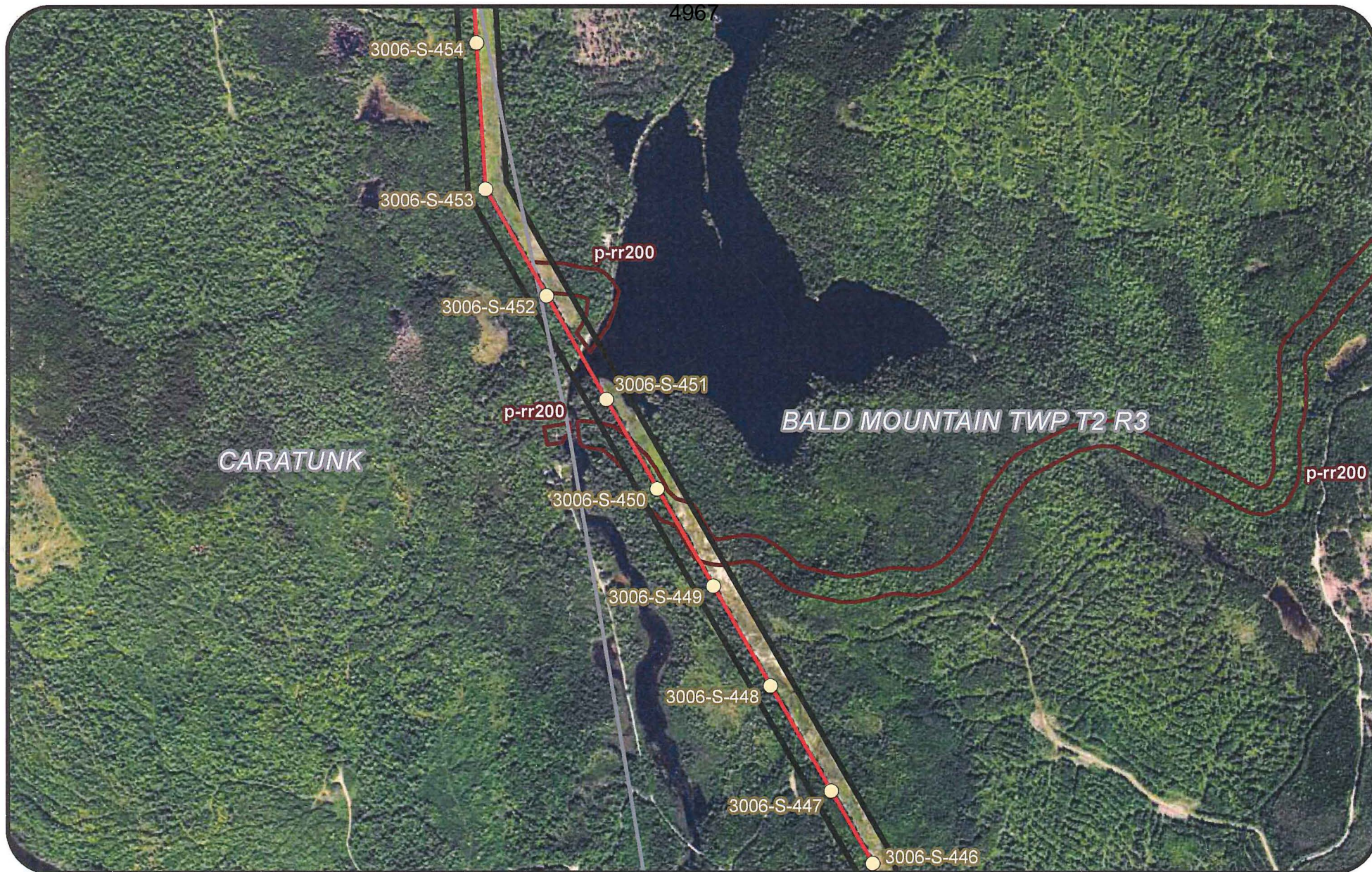
**New England
Clean Energy
Connect**
Kennebec HDD

2,000
Feet








CMP-3-C

10/19/2018



Legend

- | | |
|---|---|
|  CMP Ownership / Easement Extent | LUPC Zone |
|  Project Centerline |  p-rr; p-rr200 |
|  Proposed Structures | |
|  Town Boundary | |



New England Clean Energy Connect

Figure 25-4 Appalachian Trail

1,000
Feet



CMP-3-D

Goodwin, Mark

From: Swartz, Beth <Beth.Swartz@maine.gov>
Sent: Tuesday, August 21, 2018 10:36 AM
To: Goodwin, Mark
Cc: Perry, John
Subject: RE: Roaring Brook Mayfly Survey - Entomologist

Hi Mark,

I have spoken with Marcia Siebenmann, who MDIFW has contracted to do our Roaring Brook Mayfly surveys in the past, and she is interested and available to do the work. I think her preference would be to take the lead on a subset of the sites while using that as an opportunity to train someone on your team to assist and then independently do the remainder of the sites (i.e., the more difficult access sites). If this is an arrangement that can work for you folks, I will put you in contact with each other. Marcia would definitely be the most experienced person to conduct these surveys, and MDIFW would have full confidence in her ability to further assess potential habitat in the field and perform adequate survey coverage following MDIFW protocol.

I'm not in the office today but will review the shape files you sent when I'm back in tomorrow and finalize a narrowed down list of your original stream inspections by the end of the day. Then we will have a better idea of how many sites will need to be visited in the field and potentially surveyed.

I've also been in touch with Steve Burian and he is on board to do the identifications of any samples that are submitted. MDIFW will contract Dr. Burian for this work on behalf of the applicant and submit an invoice to the applicant for reimbursement. We should touch base about this to make sure this arrangement is acceptable and facilitated on both ends.

beth

~~~~~  
**Beth I. Swartz**  
**Wildlife Biologist**  
 Reptile, Amphibian, and Invertebrate Group  
 Maine Department of Inland Fisheries and Wildlife  
 650 State Street  
 Bangor, ME 04401  
 (207) 941-4476  
[mefishwildlife.com](http://mefishwildlife.com) | [facebook](https://www.facebook.com/mefishwildlife) | [twitter](https://twitter.com/mefishwildlife)

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*Information that you wish to keep confidential should not be included in email correspondence.*

**From:** Goodwin, Mark [mailto:magoodwin@burnsmcd.com]  
**Sent:** Monday, August 20, 2018 11:38 AM  
**To:** Swartz, Beth <Beth.Swartz@maine.gov>  
**Cc:** Perry, John <John.Perry@maine.gov>  
**Subject:** Roaring Brook Mayfly Survey - Entomologist

Hi Beth:

As you might imagine, it has been difficult locating an entomologist on short notice and for a short duration assignment. I have identified an entomologist at UMass that is available to assist with the surveys on the NECEC project (his resume does not include mayfly experience but I'm sure he knows his taxonomy, etc.). You had mentioned that you know someone who might be interested as well. If this person is interested I would need to know soon enough to get the paperwork in place.

I'll be sending the most up to date project shapefiles and .kmz file later today (~2:00-3:00pm)

Thanks again,

**Mark Goodwin, CPESC \ Burns & McDonnell**

Senior Environmental Scientist

207-517-8482 \ Mobile 207-416-5707

[magoodwin@burnsmcd.com](mailto:magoodwin@burnsmcd.com) \ burnsmcd.com

27 Pearl Street \ Portland, ME 04101



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**Goodwin, Mark**

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**From:** deMaynadier, Phillip <Phillip.deMaynadier@maine.gov>  
**Sent:** Wednesday, August 01, 2018 9:45 AM  
**To:** Goodwin, Mark  
**Subject:** RE: Herpetologists

Hi Mark,  
 Yes, Trevor would be excellent.

Here is his contact information: [trevor.persons@nau.edu](mailto:trevor.persons@nau.edu); cell: 207-313-2940.

He is at a conference this week in MA but should be back on Friday.

Phillip

**Phillip deMaynadier. Ph.D.**  
 Wildlife Biologist, Wildlife Research Assessment Section  
 Maine Department of Inland Fisheries and Wildlife  
 Office: 207-941-4239 / Cell: 207-692-3364

---

**From:** Goodwin, Mark [mailto:magoodwin@burnsmcd.com]  
**Sent:** Tuesday, July 31, 2018 8:56 AM  
**To:** deMaynadier, Phillip <Phillip.deMaynadier@maine.gov>  
**Subject:** Herpetologists

Good morning Phillip:

In our June 4th meeting to discuss state-listed species on the NECEC project, you mentioned Trevor Persons could be a good candidate for salamander surveys. Do you happen to have his contact information?

Thank you,

**Mark Goodwin, CPESC \ Burns & McDonnell**  
 Senior Environmental Scientist  
 207-517-8482 \ Mobile 207-416-5707  
[magoodwin@burnsmcd.com](mailto:magoodwin@burnsmcd.com) \ burnsmcd.com  
 27 Pearl Street \ Portland, ME 04101

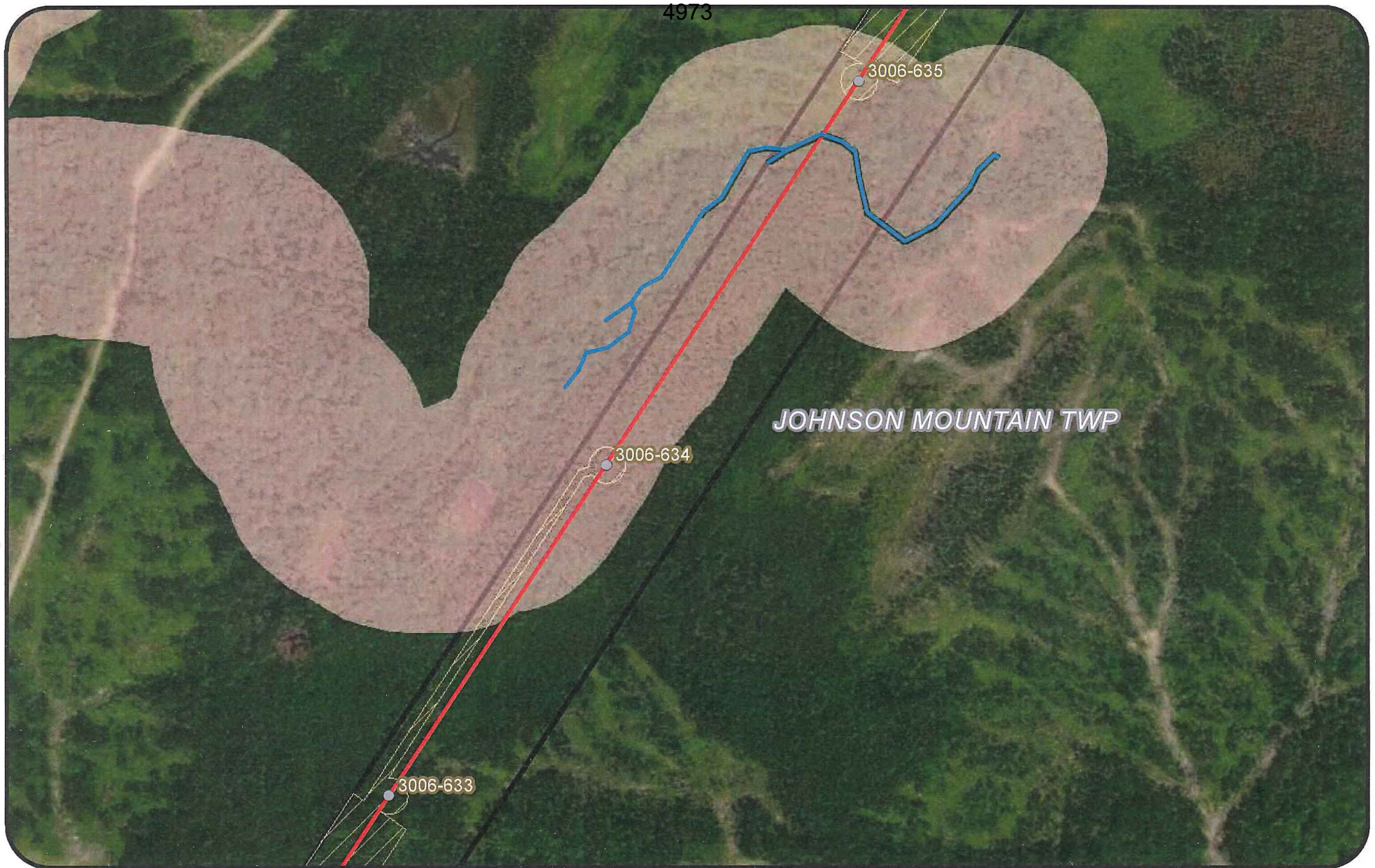


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#### Legend

-  CMP Ownership / Easement Extent
-  Mountain Brook and Tributaries
-  Project Centerline
-  Conservation Management Area
-  Proposed Structure
-  Clearing Limit
-  Town Boundary



#### New England Clean Energy Connect

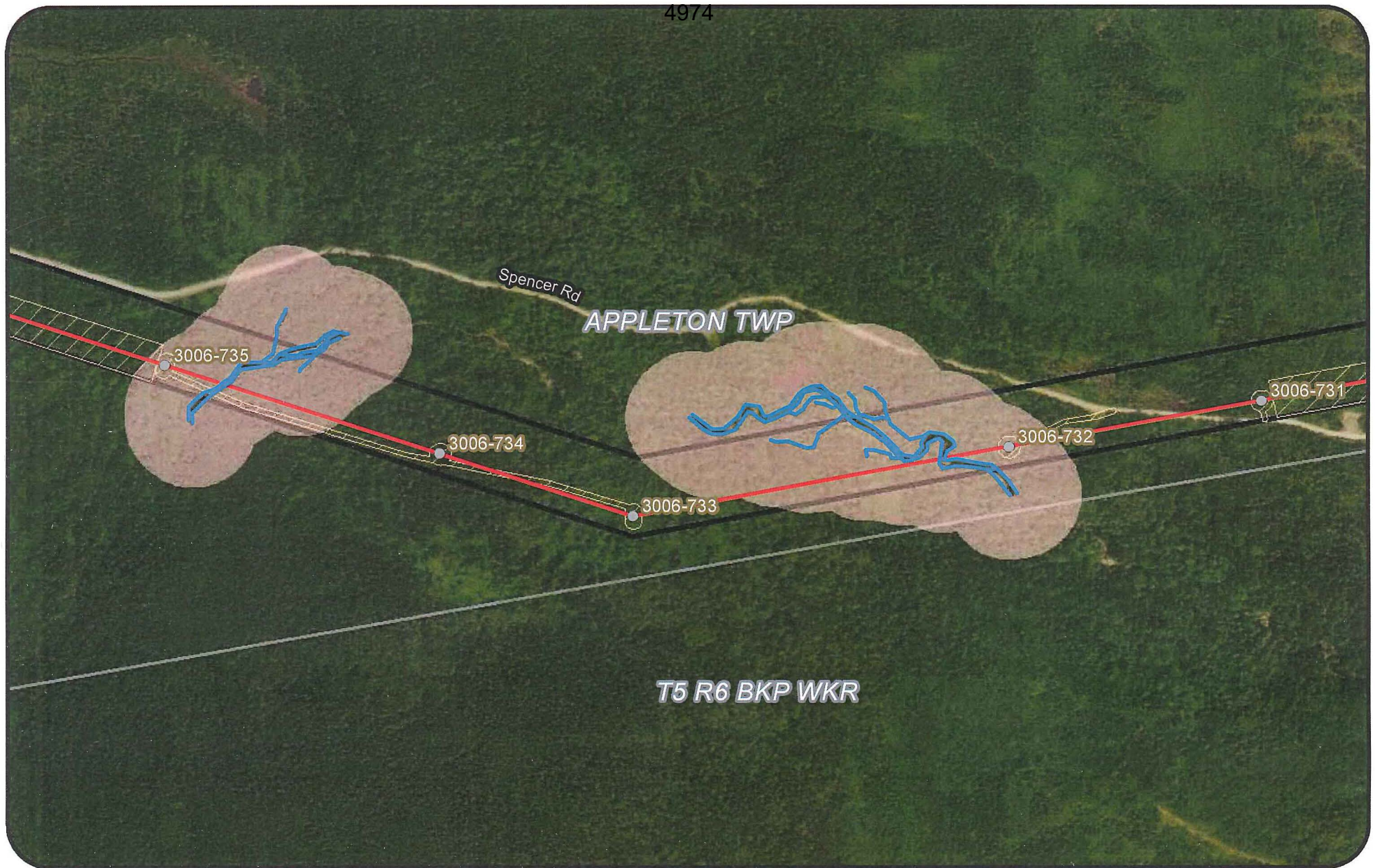
Figure 3  
Mountain Brook Rare Species CMA

300  
Feet



CMP-3-F





### Legend

- CMP Ownership / Easement Extent
- Project Centerline
- Proposed Structure
- Town Boundary
- Gold Brook and Tributaries
- Conservation Management Area
- Clearing Limit



### New England Clean Energy Connect

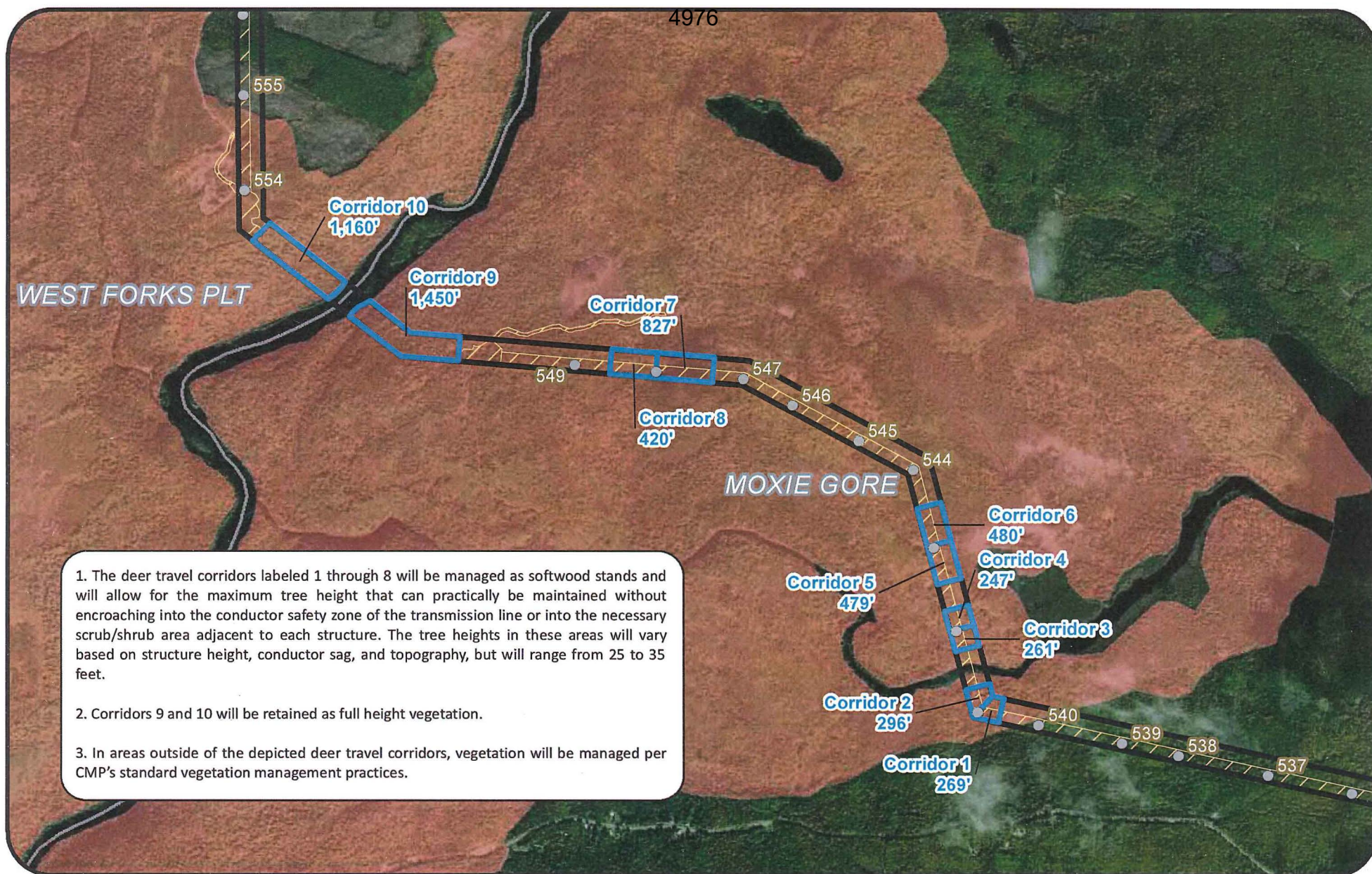
Figure 2  
Gold Brook Rare Species CMA

500 Feet









#### Legend

- CMP Ownership
- Deer Travel Corridor
- Proposed Structure
- Deer Wintering Area
- Town Boundary
- Clearing Limit



#### New England Clean Energy Connect

Figure 4  
Upper Kennebec Deer Travel Corridors

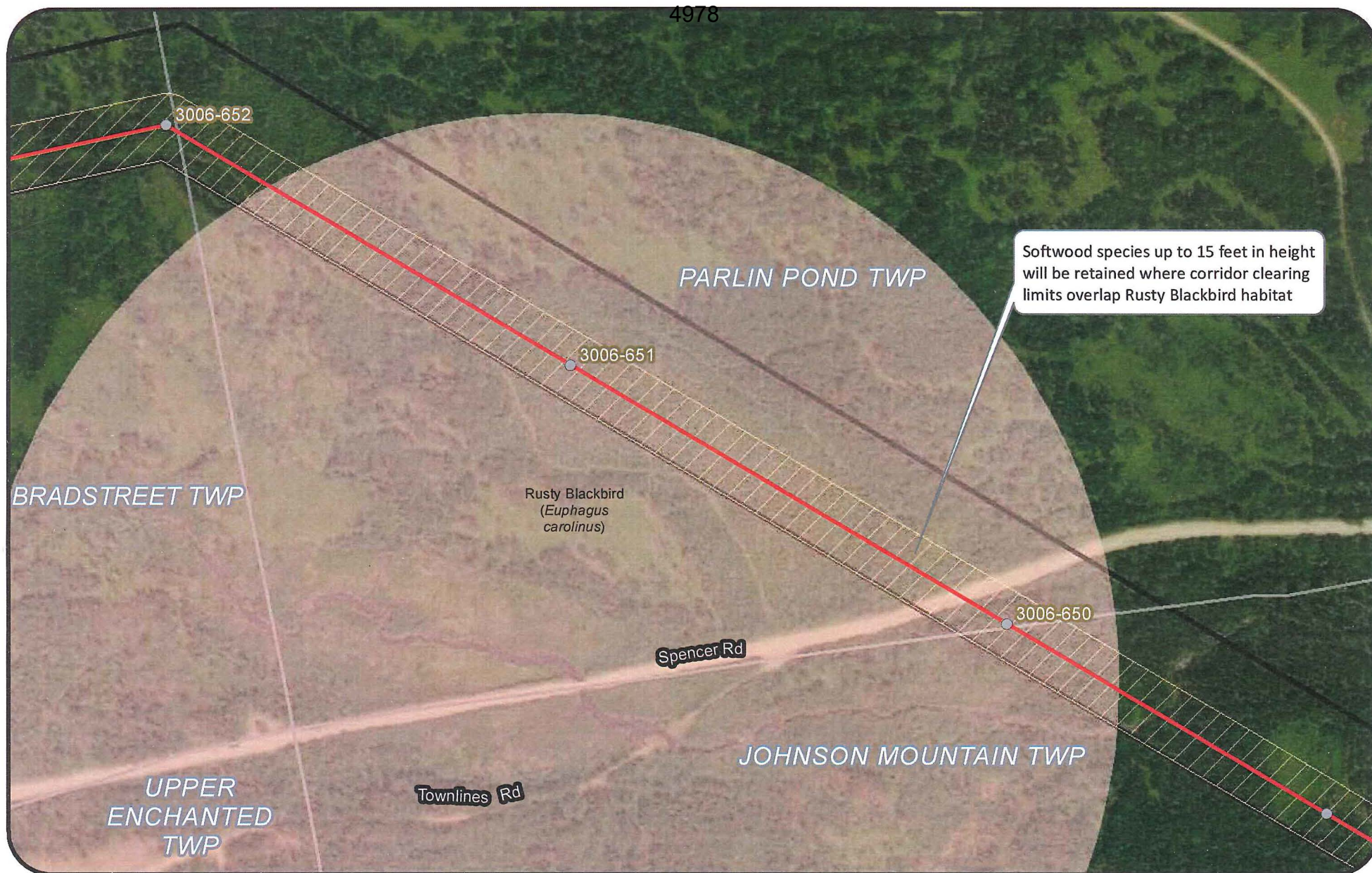
1,500 Feet



CMP-3-G







#### Legend

- CMP Ownership
- Project Centerline
- Proposed Structure
- Town Boundary
- Rusty Blackbird Habitat
- Clearing Limit



#### New England Clean Energy Connect

Figure 5: Rusty Blackbird  
Vegetation Management Area

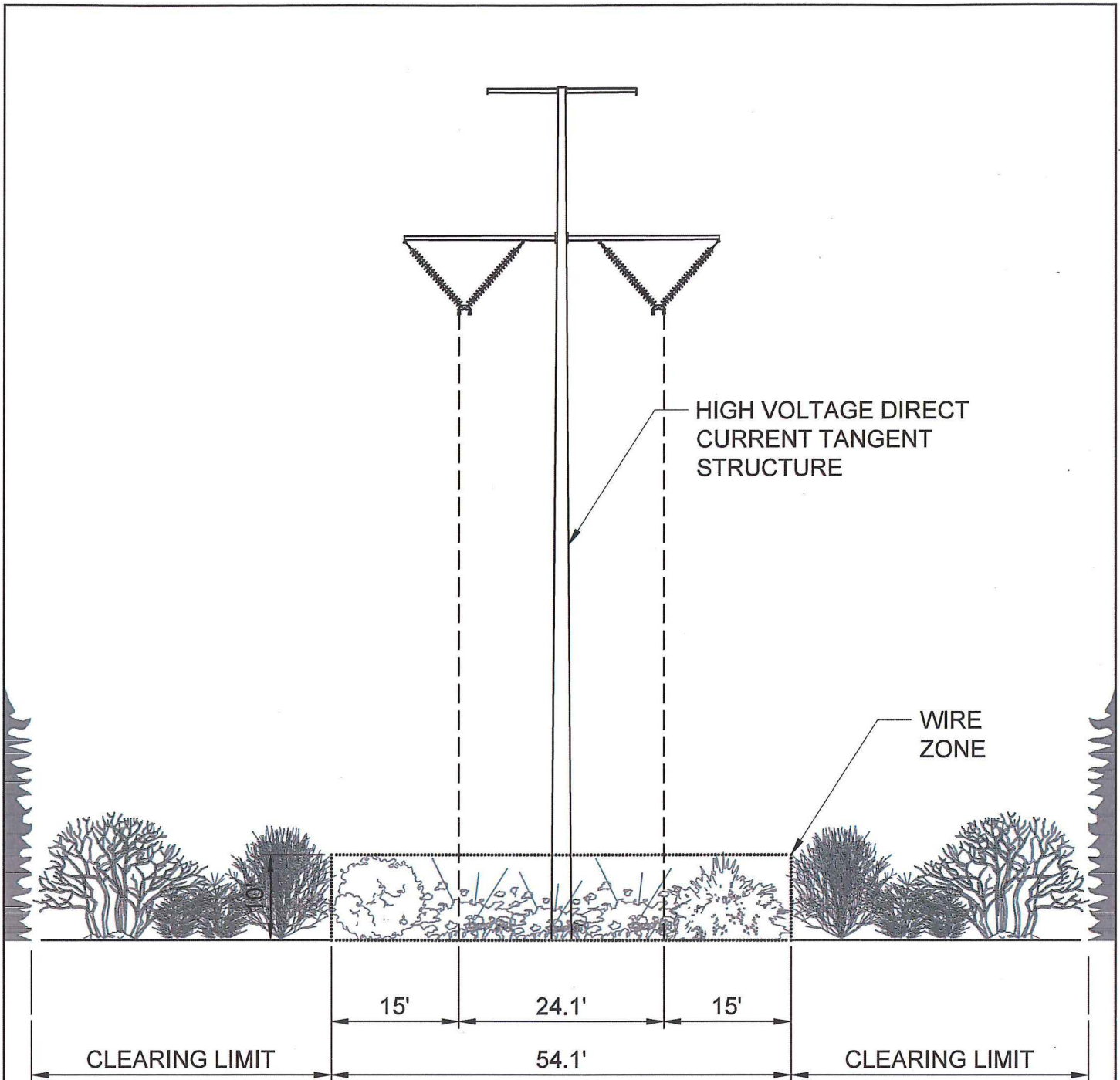
250  
Feet



CMP-3-H







SCALE: N.T.S.

**CENTRAL MAINE  
POWER**

CENTRAL MAINE POWER COMPANY

VEGETATION MAINTENANCE -  
HIGH VOLTAGE DIRECT CURRENT  
TANGENT STRUCTURE DETAIL





Exhibit 1-4 Compensation Package Summary as Required by USACE and NRPA

| Project Impact                                   |                                                         |                                              |         | Compensation Required <sup>1</sup> |                                              |                             | Compensation Sites                   |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|--------------------------------------------------|---------------------------------------------------------|----------------------------------------------|---------|------------------------------------|----------------------------------------------|-----------------------------|--------------------------------------|----------------------------------|-------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Activity                                         |                                                         | Square feet                                  | Acres   | Agency Required by                 | Compensation Ratio X Adjustment <sup>2</sup> | Estimated Quantity Required | Flagstaff Lake Tract                 | Little Jimmie Pond-Harwood Tract | Pooler Pond Tract             | Total Compensation                                                                                                                                                                                                                                                                                                                        |
|                                                  |                                                         |                                              |         |                                    |                                              |                             | Total Acres= 831.39                  | Total Acres= 109.77              | Total Acres= 81.24            | Total Area= 1022.40                                                                                                                                                                                                                                                                                                                       |
| Impact to Wetlands                               | Permanent Fill in Wetlands (Non-WOSS)                   | 13,389                                       | 0.307   | USACE & MDEP                       | 30:1 <sup>6</sup><br>USACE ratio applied     | 9.22                        | 423.96 of wetland preservation       | 68.46 of wetland preservation    | 18.33 of wetland preservation | 510.75 acres of wetland preservation to offset 4.12 acres of Permanent Fill in Wetlands (WOSS and Non-WOSS), 28.51 acres of Temporary Wetland Fill in PSS, and 105.55 of Permanent Forested Wetland Conversion, which is 13.45 acres over the amount of compensation required.<br><br>\$154,535.04 ILF for Temporary Wetland Fill in PEM. |
|                                                  | Permanent Fill in WOSS <sup>3</sup>                     | 166,146                                      | 3.814   | USACE & MDEP                       | 30:1 <sup>6</sup><br>USACE ratio applied     | 114.43                      |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Temporary Wetland Fill in PEM (<18 months)              | 835,486                                      | 19.180  | USACE                              | See Exhibit 1-5A In-Lieu Fee Summary         |                             |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Temporary Wetland Fill in PSS <sup>4</sup> (<18 months) | 1,241,744                                    | 28.507  | USACE                              | 20:1 x 0.10<br>USACE ratio applied           | 57.01                       |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Permanent Forested Wetland Conversion <sup>5</sup>      | 4,597,680                                    | 105.548 | USACE                              | 20:1 x 0.15<br>USACE ratio applied           | 316.64                      |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Total Impact:                                           | 6,854,445                                    | 157.356 |                                    | Total Ac. Required:                          | 497.30                      |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
| Impact to Significant Vernal Pool Habitat (250') | Permanent Wetland Fill in SVPH                          | 32,365                                       | 0.743   | USACE & MDEP                       | See Exhibit 1-5A In-Lieu Fee Summary         |                             | See Exhibit 1-5A In-Lieu Fee Summary |                                  | \$641,653.12 ILF amount       |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Permanent Forested Wetland Conversion SVPH              | 169,670                                      | 3.895   | USACE & MDEP                       |                                              |                             |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Permanent Upland Fill in SVPH                           | 31,370                                       | 0.720   | MDEP                               |                                              |                             |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Permanent Upland Conversion in SVPH                     | 1,289,691                                    | 29.607  | MDEP                               |                                              |                             |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Total Impact:                                           | 1,523,096                                    | 34.965  |                                    | Total Ac. Required:                          | n/a                         |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
| Impact to USACE Jurisdictional Vernal Pools      | Direct Fill in Vernal Pool Depression or 100' Envelope  | 96,610                                       | 2.218   | USACE                              | See Exhibit 1-5A In-Lieu Fee Summary         |                             | See Exhibit 1-5A In-Lieu Fee Summary |                                  | \$2,024,875.37 ILF amount     |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | High Value Vernal Pools <sup>7</sup>                    | 49                                           |         | USACE                              |                                              |                             |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Medium Value Vernal Pools                               | 122                                          |         | USACE                              |                                              |                             |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Low Value Vernal Pools                                  | 71                                           |         | USACE                              |                                              |                             |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Total Impact:                                           | 2.22 acres of direct fill / 242 vernal pools |         |                                    |                                              |                             |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
| Impact to Inland Wading Brd & Waterfowl          | Permanent Wetland Fill in IWWH                          | 149                                          | 0.003   | USACE & MDEP                       | See Exhibit 1-5A In-Lieu Fee Summary         |                             | See Exhibit 1-5A In-Lieu Fee Summary |                                  | \$253,352.53 ILF amount       |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Permanent Forested Wetland Conversion IWWH              | 114,232                                      | 2.622   | USACE & MDEP                       |                                              |                             |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Permanent Upland Fill in IWWH                           | 598                                          | 0.014   | MDEP                               |                                              |                             |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Permanent Upland Conversion in IWWH                     | 539,556                                      | 12.387  | MDEP                               |                                              |                             |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|                                                  | Total Impact:                                           | 654,535                                      | 15.026  |                                    | Total Ac. Required:                          | n/a                         |                                      |                                  |                               |                                                                                                                                                                                                                                                                                                                                           |
|                                                  |                                                         |                                              |         |                                    |                                              |                             | Total In-Lieu Fee Payment            |                                  | \$3,074,416.06                |                                                                                                                                                                                                                                                                                                                                           |
|                                                  |                                                         |                                              |         |                                    |                                              |                             | Total Compensation Land              |                                  | 1022.40 Acres                 |                                                                                                                                                                                                                                                                                                                                           |

<sup>1</sup> Based on ratios and adjustments within the DEP Fact Sheet-In-Lieu Fee Compensation Program, 2016 USACE New England District Compensatory Mitigation Guidance and discussions held during the Compensation Working Session on 4/3/18, with the USACE and MDEP, as shown in Exhibit 1-1. ☐

<sup>2</sup> In each case where compensation is required by both the MDEP and USACE, the higher ratio and adjustment was applied.

<sup>3</sup> Permanent wetland fill to PEM and PSS wetlands within SVPH and IWWH are excluded from this calculation and are calculated separately within their own respective categories.

<sup>4</sup> Given that hydrology or significant soil disturbance will not result, all forested wetlands will convert to scrub-shrub wetland.

<sup>5</sup> Conversion of forested wetlands excludes clearing within SVPH or IWWH and are calculated separately within their own respective categories.

<sup>6</sup> CMP offered a ratio of 30:1 to the USACE, which is above the 20:1 required, for land preservation for their consideration of the compensation parcels offered as part of this plan.

<sup>7</sup> Excludes impacts to SVPH.

## Exhibit 1-5A: In-Lieu Fee Summary

| Impact Type                                                            |                                                                            | Resource Impact               |         | In Lieu (ILF) Fee Compensation (MDEP & USACE) <sup>1</sup>                                         |            | Adjustments to Standard Ratios/Amounts <sup>2</sup> |          | ILF Payment                   |
|------------------------------------------------------------------------|----------------------------------------------------------------------------|-------------------------------|---------|----------------------------------------------------------------------------------------------------|------------|-----------------------------------------------------|----------|-------------------------------|
|                                                                        |                                                                            | Sq ft                         | Acres   | Formula                                                                                            | Multiplier | DEP                                                 | USACE    |                               |
| Wetland Impact                                                         | Permanent Fill in Wetlands (Non-WOSS)<br>See Exhibit 1-4                   | 13,389                        | 0.307   | Natural Resource Enhancement & Restoration Cost/Sq. Ft. X<br>Avg. Assessed Land Value/Sq. Ft.      | 1          | 100%                                                | 100%     | Preservation, See Exhibit 1-4 |
|                                                                        | Permanent Fill in WOSS <sup>3</sup><br>See Exhibit 1-4                     | 166,146                       | 3.814   | Natural Resource Enhancement & Restoration Cost/Sq. Ft. X<br>Avg. Assessed Land Value/Sq. Ft.      | 2          | 100%                                                | 100%     | Preservation, See Exhibit 1-4 |
|                                                                        | Temporary Wetland Fill in PEM (<18 months)<br>See Table 1-5.1              | 835,486                       | 19.180  | Natural Resource Enhancement & Restoration Cost/Sq. Ft. X<br>Avg. Assessed Land Value/Sq. Ft.      | 1          | USACE only                                          | 5%       | \$154,535.04                  |
|                                                                        | Temporary Wetland Fill in PSS <sup>4</sup> (<18 months)<br>See Exhibit 1-4 | 1,241,744                     | 28.507  | Natural Resource Enhancement & Restoration Cost/Sq. Ft. X<br>Avg. Assessed Land Value/Sq. Ft.      | 1          | USACE only                                          | 10%      | Preservation, See Exhibit 1-4 |
|                                                                        | Permanent Forested Wetland Conversion <sup>5</sup><br>See Exhibit 1-4      | 4,597,680                     | 105.548 | Natural Resource Enhancement & Restoration Cost/Sq. Ft. X<br>Avg. Assessed Land Value/Sq. Ft.      | 1          | USACE only                                          | 15%      | Preservation, See Exhibit 1-4 |
| Impact to MDEP Significant Vernal Pool Habitat (250')                  | Permanent Wetland Fill in SVPH<br>See Table 1-5.2                          | 32,365                        | 0.743   | Natural Resource Enhancement & Restoration Cost/Sq. Ft. X<br>Avg. Assessed Land Value/Sq. Ft.      | 2          | 100%                                                | 100%     | \$244,669.00                  |
|                                                                        | Permanent Forested Wetland Conversion SVPH<br>See Table 1-5.3              | 169,670                       | 3.895   | Natural Resource Enhancement & Restoration Cost/Sq. Ft. X<br>Avg. Assessed Land Value/Sq. Ft.      | 1          | 60%                                                 | 15%      | \$335,360.93                  |
|                                                                        | Permanent Upland Fill in SVPH<br>See Table 1-5.4                           | 31,370                        | 0.720   | Avg. Assessed Land Value/Sq. Ft.                                                                   | 1          | 100%                                                | DEP only | \$5,294.90                    |
|                                                                        | Permanent Upland Conversion in SVPH<br>See Table 1-5.5                     | 1,289,691                     | 29.607  | Avg. Assessed Land Value/Sq. Ft.                                                                   | 1          | 60%                                                 | DEP only | \$56,328.29                   |
| Impact to USACE Jurisdictional Vernal Pool Habitat <sup>7</sup> (750') | Direct Fill in Vernal Pool Depression or 100' Envelope<br>See Table 1-5.6a | 96,610                        | 2.218   | Natural Resource Enhancement & Restoration Cost/Sq. Ft. X<br>Avg. Assessed Land Value/Sq. Ft.      | 1          | USACE only                                          | 100%     | \$382,331.87                  |
|                                                                        | High Value Vernal Pools <sup>7</sup><br>See Table 1-5.6b                   | 49 High Value Vernal Pools    |         | (13,000 Sq. ft x 5) X (Natural Resource Enhancement & Restoration Cost + Avg. Assessed Land Value) | 1          | USACE only                                          | 5%       | \$586,592.50                  |
|                                                                        | Medium Value Vernal Pools<br>See Table 1-5.6c                              | 122 Medium Value Vernal Pools |         | (13,000 Sq. ft x 3) X (Natural Resource Enhancement & Restoration Cost + Avg. Assessed Land Value) | 1          | USACE only                                          | 5%       | \$889,219.50                  |
|                                                                        | Low Value Vernal Pools<br>See Table 1-5.6d                                 | 71 Low Value Vernal Pools     |         | (13,000 Sq. ft x 1) X (Natural Resource Enhancement & Restoration Cost + Avg. Assessed Land Value) | 1          | USACE only                                          | 5%       | \$166,731.50                  |
| Inland Wading Bird & Waterfowl Habitat (IWWH)                          | Permanent Wetland Fill in IWWH<br>Table 1-5.7                              | 149                           | 0.003   | Natural Resource Enhancement & Restoration Cost/Sq. Ft. X<br>Avg. Assessed Land Value/Sq. Ft.      | 2          | 100%                                                | 100%     | \$1,165.18                    |
|                                                                        | Permanent Forested Wetland Conversion IWWH<br>Table 1-5.8                  | 114,232                       | 2.622   | Natural Resource Enhancement & Restoration Cost/Sq. Ft. X<br>Avg. Assessed Land Value/Sq. Ft.      | 1          | 60%                                                 | 15%      | \$238,446.60                  |
|                                                                        | Permanent Upland Fill in IWWH<br>See Table 1-5.9                           | 598                           | 0.014   | Avg. Assessed Land Value/Sq. Ft.                                                                   | 1          | 100%                                                | DEP only | \$56.80                       |
|                                                                        | Permanent Upland Conversion in IWWH<br>See Table 1-5.10                    | 539,556                       | 12.387  | Avg. Assessed Land Value/Sq. Ft.                                                                   | 1          | 60%                                                 | DEP only | \$13,683.95                   |
| Total In-Lieu Fee Payment                                              |                                                                            |                               |         |                                                                                                    |            |                                                     |          | \$3,074,416.06                |

<sup>1</sup> In each case where compensation is required by both the MDEP and USACE, the higher ratio and adjustment was applied.

<sup>2</sup> Ratios and adjustments are based in part on the DEP Fact Sheet-In-Lieu Fee Compensation Program, 2016 USACE New England District Compensatory Mitigation Guidance and discussions held during the Compensation Working Session on 4/3/18, with the USACE and MDEP, as shown in Exhibit 1-1.

<sup>3</sup> Permanent wetland fill to PEM and PSS wetlands within SVPH and IWWH are excluded from this calculation and are calculated separately in their own respective categories.

<sup>4</sup> Given that hydrology or significant soil disturbance will not result, all forested wetlands will convert to scrub-shrub wetland.

<sup>5</sup> Conversion of forested wetlands excludes clearing within SVPH or IWWH, and are calculated separately in their own respective categories.

<sup>6</sup> Permanent wetland fill and forested wetland conversion impacts (shaded gray) in SVPH are included in the calculations provided in the Wetland Impact section of the table.

<sup>7</sup> Excludes impacts to SVPH.

<sup>8</sup> Permanent wetland fill and forested wetland conversion impacts (shaded gray) in IWWH are included in the calculations provided in the Wetland Impact section of the table.

Exhibit 1-5B: Summary of Compensation Resulting from Consultation with Resource Agencies

| Impact Type                                              |                                                                                                                                  | Resource Impact                                                                                              |        | Compensation Rationale                                                                                                                                                                                                                                                           | Resource Agency/Fund                       | Monetary Contribution/Land Preservation                                     |
|----------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------|--------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------|-----------------------------------------------------------------------------|
|                                                          |                                                                                                                                  | Sq ft                                                                                                        | Acres  |                                                                                                                                                                                                                                                                                  |                                            |                                                                             |
| Impact to Unique Natural Communities (MNAP)              | Forested Conversion in Unique Natural Communities<br>See Table 1-5.11                                                            | 402,008                                                                                                      | 9.229  | (Area of impact + MNAP identified directional buffers) x Avg. Assessed Land Value/Sq. Ft. <sup>1</sup> x Multiplier of 8                                                                                                                                                         | Maine Natural Areas Conservation Fund      | \$1,224,526.82                                                              |
|                                                          | Forested Conversion to Goldie's Wood Fern                                                                                        | Goldie's Wood Fern                                                                                           |        | MNAP determined that adequate compensation for clearing impacts to the Goldie's Wood Fern is funding for rare plant surveys. The amount of funding was mutually agreed upon by MNAP and CMP.                                                                                     | Maine Natural Areas Conservation Fund      | \$10,000.00                                                                 |
| Impact to Rare Species Streams (MDIFW)                   | Forested Conversion in the Roaring Brook Mayfly and Northern Spring Salamander Conservation Management Areas<br>See Table 1-5.12 | 1,150,681                                                                                                    | 26.416 | Avg. Assessed Land Value/Sq. Ft. <sup>1</sup> x Multiplier of 8 <sup>2</sup>                                                                                                                                                                                                     | Maine Endangered and Nongame Wildlife Fund | \$469,771.95                                                                |
| Impact to Coldwater Fisheries (MDEP / MDIFW)             | Forested Conversion in Riparian Buffers                                                                                          | 11.02 linear miles of all waterbodies within the NECEC project area will be impacted by forested conversion. |        | The Grand Falls Tract, Lower Enchanted Tract, and Basin Tract total 1053.50 acres, and contain 12.02 linear miles of stream to offset forest conversion impacts to riparian buffers within the NECEC project area.                                                               | Conservation recipient to be determined    | 1053.50 acres of Land Preservation containing 12.02 linear miles of stream. |
|                                                          |                                                                                                                                  |                                                                                                              |        | The Culvert Replacement Program includes repair, removal or replacement of culverts within CMP-controlled lands during construction of the NECEC. Additionally, CMP will provide funding sufficient to replace approximately 20-35 culverts on lands outside of CMP's ownership. | Grant recipient to be determined           | \$200,000.00                                                                |
|                                                          |                                                                                                                                  |                                                                                                              |        | The monetary contribution amount was based on the estimated labor and equipment costs to implement Chop and Drop on 87 perennial streams (Segment 1), which has been removed from the Compensation Plan at the request of MDIFW.                                                 | Maine Endangered and Nongame Wildlife Fund | \$180,000.00                                                                |
| Impact to Outstanding River Segments <sup>3</sup> (MDEP) | Four Outstanding River Segments will be impacted by forested conversion.                                                         | 425 linear feet or 850 feet of river frontage (both banks)                                                   |        | The Grand Falls Tract, Lower Enchanted Tract, and Basin Tract, collectively offer 7.9 miles of frontage on the Dead River, an Outstanding River Segment.                                                                                                                         | Conservation recipient to be determined    | 7.9 miles of frontage preserved on an Outstanding River Segment             |
| Impact to Deer Wintering Areas (DWA) (MDIFW)             | Forested Conversion in the Upper Kennebec DWA                                                                                    | 1,707,943                                                                                                    | 39.209 | Preservation of 717 acres within the Upper Kennebec DWA, which is sufficiently more than the recommended 8:1, an excess of 402 acres, and at a ratio of greater than 18:1.                                                                                                       | Conservation recipient to be determined    | 717 acres of Land Preservation within the Upper Kennebec DWA                |
| Total Additional Monetary Contributions                  |                                                                                                                                  |                                                                                                              |        |                                                                                                                                                                                                                                                                                  |                                            | \$2,084,298.76                                                              |
| Total Additional Land Preservation                       |                                                                                                                                  |                                                                                                              |        |                                                                                                                                                                                                                                                                                  |                                            | 1770.50 Acres                                                               |

<sup>1</sup> Source: MDEP Fact Sheet- In Lieu Fee Compensation Program (rev 2017).<sup>2</sup> On 11/8/2018, MDIFW recommended a resource multiplier of 8 be applied to the fee calculation for each species present, where both species are present a multiplier of 16 was applied.<sup>3</sup> Outstanding River Segments, as identified in 38 M.R.S. § 480-P and 12 M.R.S. § 403



**Table 1-5.1 ILF Compensation for Temporary Wetland Fill in Emergent Wetlands**

|                                         |                           |                              | Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X<br>(Natural Resource Enhancement and Restoration Cost + Assessed<br>Land Value) x (Resource Multiplier) <sup>2</sup> |                                                                       |                             |                     |
|-----------------------------------------|---------------------------|------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------|-----------------------------|---------------------|
| NECEC Project<br>Component <sup>1</sup> | Total<br>Acres of<br>Fill | Resource Impact<br>(sq. ft.) | County                                                                                                                                                                           | Natural<br>Resource<br>Enhancement<br>and<br>Restoration<br>Cost (\$) | Assessed Land<br>Value (\$) | In-Lieu Fee (\$)    |
| Transmission Structures                 | 6.213                     | 270,648                      | Androscoggin                                                                                                                                                                     | 3.61                                                                  | 0.17                        | \$51,152.47         |
| Transmission Structures                 | 0.834                     | 36,336                       | Cumberland                                                                                                                                                                       | 3.61                                                                  | 0.69                        | \$7,812.24          |
| Transmission Structures                 | 2.058                     | 89,641                       | Franklin                                                                                                                                                                         | 2.86                                                                  | 0.03                        | \$12,953.12         |
| Transmission Structures                 | 0.097                     | 4,221                        | Kennebec                                                                                                                                                                         | 3.61                                                                  | 0.16                        | \$795.66            |
| Transmission Structures                 | 3.941                     | 171,670                      | Lincoln                                                                                                                                                                          | 3.61                                                                  | 0.3                         | \$33,561.49         |
| Transmission Structures                 | 0.535                     | 23,307                       | Sagadahoc                                                                                                                                                                        | 3.61                                                                  | 0.27                        | \$4,521.56          |
| Transmission Structures                 | 5.502                     | 239,663                      | Somerset                                                                                                                                                                         | 3.61                                                                  | 0.04                        | \$43,738.50         |
| <b>Total</b>                            | <b>19.180</b>             | <b>835,486</b>               |                                                                                                                                                                                  |                                                                       | <b>Total In-Lieu Fee</b>    | <b>\$154,535.04</b> |
|                                         | <b>Acres</b>              | <b>Sq. ft.</b>               |                                                                                                                                                                                  |                                                                       |                             |                     |

<sup>1</sup> Impacts are restricted to the temporary access for transmission line structures. There is no temporary wetland fill associated with substation development.

<sup>2</sup> Resource multiplier of 1 and an adjustment of 5%.

Table 1-5.2 ILF Compensation for Permanent Wetland Fill in SVPH

| Permanent Wetland Fill in SVPH <sup>1</sup> |                     |                           |                               |       |        |                                 |                                         | Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier) <sup>2</sup> |                                                        |                          |                     |
|---------------------------------------------|---------------------|---------------------------|-------------------------------|-------|--------|---------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------|---------------------|
| NECEC Project Component                     | Total Acres of Fill | Resource Impact (sq. ft.) | Cowardin Cover Type (Sq. Ft.) |       |        | HUC8 Watershed                  | Bailey and Keys Ecoregion               | County                                                                                                                                                                     | Natural Resource Enhancement and Restoration Cost (\$) | Assessed Land Value (\$) | In-Lieu Fee (\$)    |
|                                             |                     |                           | PEM                           | PFO   | PSS    |                                 |                                         |                                                                                                                                                                            |                                                        |                          |                     |
| Transmission                                | 0.001               | 40                        | 0                             | 0     | 40     | NA                              | Central Maine Embayment                 | Androscoggin                                                                                                                                                               | 3.61                                                   | 0.17                     | \$302.40            |
| Transmission                                | 0.000               | 0                         | 0                             | 0     | 0      | NA                              | Presumpscot River and Casco Bay         | Cumberland                                                                                                                                                                 | 3.61                                                   | 0.69                     | \$0.00              |
| Transmission                                | 0.000               | 0                         | 0                             | 0     | 0      | NA                              | Western Foothills and Central Mountains | Franklin                                                                                                                                                                   | 2.86                                                   | 0.03                     | \$0.00              |
| Transmission                                | 0.000               | 0                         | 0                             | 0     | 0      | NA                              | Central Interior                        | Kennebec                                                                                                                                                                   | 3.61                                                   | 0.16                     | \$0.00              |
| Transmission                                | 0.000               | 0                         | 0                             | 0     | 0      | NA                              | Midcoast Region                         | Lincoln                                                                                                                                                                    | 3.61                                                   | 0.3                      | \$0.00              |
| Transmission                                | 0.000               | 0                         | 0                             | 0     | 0      | NA                              | Midcoast Region                         | Sagadahoc                                                                                                                                                                  | 3.61                                                   | 0.27                     | \$0.00              |
| Transmission                                | 0.001               | 40                        | 0                             | 40    | 0      | NA                              | Western Mountains                       | Somerset                                                                                                                                                                   | 3.61                                                   | 0.04                     | \$292.00            |
| Merrill Road Converter                      | 0.741               | 32,285                    | 1,397                         | 1,308 | 29,580 | Lower Androscoggin River        | Central Maine Embayment                 | Androscoggin                                                                                                                                                               | 3.61                                                   | 0.17                     | \$244,074.60        |
| Fickett Road Substation                     | 0.000               | 0                         | 0                             | 0     | 0      | Presumpscot River and Casco Bay | Casco Bay Coast                         | Cumberland                                                                                                                                                                 | 3.61                                                   | 0.69                     | \$0.00              |
| HDD Termination Stations                    | 0.000               | 0                         | 0                             | 0     | 0      | NA                              | Western Mountains                       | Somerset                                                                                                                                                                   | 3.61                                                   | 0.04                     | \$0.00              |
| <b>Total</b>                                | <b>0.743 Acres</b>  | <b>32,365 Sq. ft.</b>     |                               |       |        |                                 |                                         |                                                                                                                                                                            |                                                        | <b>Total In-Lieu Fee</b> | <b>\$244,669.00</b> |

<sup>1</sup> Wetlands within SVPH are WOSS. For purposes of evaluating compensation, WOSS impacts shown in Exhibit 1-4 exclude WOSS associated with SVPH.

<sup>2</sup> Resource multiplier of 2.

Table 1-5.3 ILF Compensation for Permanent Forested Wetland Conversion in SVPH

| Permanent Wetland Conversion in SVPH |                     |                                        |                               |        |     |                                 |                                         | Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier) <sup>1</sup> |                                                        |                          |                                       |
|--------------------------------------|---------------------|----------------------------------------|-------------------------------|--------|-----|---------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------|---------------------------------------|
| NECEC Project Component              | Total Acres of Fill | Resource Impact (sq. ft.) <sup>1</sup> | Cowardin Cover Type (Sq. Ft.) |        |     | HUC8 Watershed                  | Bailey and Keys Ecoregion               | County                                                                                                                                                                     | Natural Resource Enhancement and Restoration Cost (\$) | Assessed Land Value (\$) | In-Lieu Fee (\$)                      |
|                                      |                     |                                        | PEM                           | PFO    | PSS |                                 |                                         |                                                                                                                                                                            |                                                        |                          |                                       |
| Transmission                         | 0.670               | 29,198                                 | 0                             | 29,198 | 0   | NA                              | Central Maine Embayment                 | Androscoggin                                                                                                                                                               | 3.61                                                   | 0.17                     | \$66,221.06                           |
| Transmission                         | 0.000               | 0                                      | 0                             | 0      | 0   | NA                              | Presumpscot River and Casco Bay         | Cumberland                                                                                                                                                                 | 3.61                                                   | 0.69                     | \$0.00                                |
| Transmission                         | 1.943               | 84,640                                 | 0                             | 84,640 | 0   | NA                              | Western Foothills and Central Mountains | Franklin                                                                                                                                                                   | 2.86                                                   | 0.03                     | \$146,765.76                          |
| Transmission                         | 0.000               | 0                                      | 0                             | 0      | 0   | NA                              | Central Interior                        | Kennebec                                                                                                                                                                   | 3.61                                                   | 0.16                     | \$0.00                                |
| Transmission                         | 0.000               | 0                                      | 0                             | 0      | 0   | NA                              | Midcoast Region                         | Lincoln                                                                                                                                                                    | 3.61                                                   | 0.3                      | \$0.00                                |
| Transmission                         | 0.000               | 0                                      | 0                             | 0      | 0   | NA                              | Midcoast Region                         | Sagadahoc                                                                                                                                                                  | 3.61                                                   | 0.27                     | \$0.00                                |
| Transmission                         | 1.252               | 54,524                                 | 0                             | 54,524 | 0   | NA                              | Western Mountains                       | Somerset                                                                                                                                                                   | 3.61                                                   | 0.04                     | \$119,407.56                          |
| Merrill Road Converter               | 0.030               | 1,308                                  | 0                             | 1,308  | 0   | Lower Androscoggin River        | Central Maine Embayment                 | Androscoggin                                                                                                                                                               | 3.61                                                   | 0.17                     | \$2,966.54                            |
| Fickett Road Substation              | 0.000               | 0                                      | 0                             | 0      | 0   | Presumpscot River and Casco Bay | Casco Bay Coast                         | Cumberland                                                                                                                                                                 | 3.61                                                   | 0.69                     | \$0.00                                |
| HDD Termination Stations             | 0.000               | 0                                      | 0                             | 0      | 0   | NA                              | Western Mountains                       | Somerset                                                                                                                                                                   | 3.61                                                   | 0.04                     | \$0.00                                |
| <b>Total</b>                         | <b>3.895 Acres</b>  | <b>169,670 Sq. ft.</b>                 |                               |        |     |                                 |                                         |                                                                                                                                                                            |                                                        |                          | <b>Total In-Lieu Fee \$335,360.93</b> |

<sup>1</sup> Resource multiplier of 1 and a 60% adjustment.



**Table 1-5.4: ILF Compensation for Permanent Upland Fill in SVPH**

|                                |                     |                           |              | Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier) <sup>1</sup> |                          |                   |
|--------------------------------|---------------------|---------------------------|--------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|-------------------|
| NECEC Project Component        | Total Acres of Fill | Resource Impact (sq. ft.) | County       | Natural Resource Enhancement and Restoration Cost (\$)                                                                                                                     | Assessed Land Value (\$) | In-Lieu Fee (\$)  |
| Transmission Structures        | 0.012               | 537                       | Androscoggin | 0                                                                                                                                                                          | 0.17                     | \$91.29           |
| Transmission Structures        | 0.001               | 60                        | Cumberland   | 0                                                                                                                                                                          | 0.69                     | \$41.40           |
| Transmission Structures        | 0.005               | 199                       | Franklin     | 0                                                                                                                                                                          | 0.03                     | \$5.97            |
| Transmission Structures        | 0.000               | 0                         | Kennebec     | 0                                                                                                                                                                          | 0.16                     | \$0.00            |
| Transmission Structures        | 0.003               | 119                       | Lincoln      | 0                                                                                                                                                                          | 0.3                      | \$35.70           |
| Transmission Structures        | 0.000               | 0                         | Sagadahoc    | 0                                                                                                                                                                          | 0.27                     | \$0.00            |
| Transmission Structures        | 0.010               | 437                       | Somerset     | 0                                                                                                                                                                          | 0.04                     | \$17.48           |
| Merrill Road Converter Station | 0.689               | 30,018                    | Androscoggin | 0                                                                                                                                                                          | 0.17                     | \$5,103.06        |
| Fickett Road Substation        | 0.000               | 0                         | Cumberland   | 0                                                                                                                                                                          | 0.69                     | \$0.00            |
| HDD Termination Stations       | 0.000               | 0                         | Somerset     | 0                                                                                                                                                                          | 0.04                     | \$0.00            |
| <b>Total</b>                   | <b>0.720 Acres</b>  | <b>31,370 Sq. ft.</b>     |              |                                                                                                                                                                            | <b>Total In-Lieu Fee</b> | <b>\$5,294.90</b> |

<sup>1</sup> Resource multiplier of 1.



**Table 1-5.5: ILF Compensation for Permanent Upland Conversion in SVPH**

| Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier) <sup>1</sup> |                           |                           |              |                                                                     |                          |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------------|--------------|---------------------------------------------------------------------|--------------------------|--------------------|
| NECEC Project Component                                                                                                                                                    | Total Acres of Conversion | Resource Impact (sq. ft.) | County       | Natural Resource Enhancement and Restoration Cost (\$) <sup>2</sup> | Assessed Land Value (\$) | In-Lieu Fee (\$)   |
| Transmission Structures                                                                                                                                                    | 7.512                     | 327,223                   | Androscoggin | 0                                                                   | 0.17                     | \$33,376.75        |
| Transmission Structures                                                                                                                                                    | 0.000                     | 0                         | Cumberland   | 0                                                                   | 0.69                     | \$0.00             |
| Transmission Structures                                                                                                                                                    | 8.765                     | 381,802                   | Franklin     | 0                                                                   | 0.03                     | \$6,872.44         |
| Transmission Structures                                                                                                                                                    | 0.000                     | 0                         | Kennebec     | 0                                                                   | 0.16                     | \$0.00             |
| Transmission Structures                                                                                                                                                    | 0.000                     | 0                         | Lincoln      | 0                                                                   | 0.3                      | \$0.00             |
| Transmission Structures                                                                                                                                                    | 0.000                     | 0                         | Sagadahoc    | 0                                                                   | 0.27                     | \$0.00             |
| Transmission Structures                                                                                                                                                    | 12.699                    | 553,190                   | Somerset     | 0                                                                   | 0.04                     | \$13,276.56        |
| Merrill Road Converter Station                                                                                                                                             | 0.631                     | 27,476                    | Androscoggin | 0                                                                   | 0.17                     | \$2,802.55         |
| Fickett Road Substation                                                                                                                                                    | 0.000                     | 0                         | Cumberland   | 0                                                                   | 0.69                     | \$0.00             |
| HDD Termination Stations                                                                                                                                                   | 0.000                     | 0                         | Somerset     | 3.61                                                                | 0.04                     | \$0.00             |
| <b>Total</b>                                                                                                                                                               | <b>29.607 Acres</b>       | <b>1,289,691 Sq. ft.</b>  |              |                                                                     | <b>Total In-Lieu Fee</b> | <b>\$56,328.29</b> |

<sup>1</sup> Resource multiplier of 1 and an adjustment of 60%.<sup>2</sup> For upland portions of SVPH, no restoration cost is associated with conversion impact to non-wetland resources.

**Table 1-5.6a: ILF Compensation for Direct Fill in USACE Jurisdictional Vernal Pools (Depression or 100-foot Envelope)**

| Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier) <sup>1</sup> |                     |                           |              |                                                        |                          |                               |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------|--------------|--------------------------------------------------------|--------------------------|-------------------------------|
| NECEC Project Component                                                                                                                                                    | Total Acres of Fill | Resource Impact (sq. ft.) | County       | Natural Resource Enhancement and Restoration Cost (\$) | Assessed Land Value (\$) | In-Lieu Fee (\$) <sup>2</sup> |
| Transmission Structures/Station                                                                                                                                            | 1.392               | 60,640                    | Androscoggin | 3.61                                                   | 0.17                     | \$229,219.20                  |
| Transmission Structures/Station                                                                                                                                            | 0.765               | 33,317                    | Cumberland   | 3.61                                                   | 0.69                     | \$143,263.10                  |
| Transmission Structures                                                                                                                                                    | 0.007               | 297                       | Franklin     | 2.86                                                   | 0.03                     | \$858.33                      |
| Transmission Structures                                                                                                                                                    | 0.000               | 0                         | Kennebec     | 3.61                                                   | 0.16                     | \$0.00                        |
| Transmission Structures                                                                                                                                                    | 0.033               | 1,454                     | Lincoln      | 3.61                                                   | 0.3                      | \$5,685.14                    |
| Transmission Structures                                                                                                                                                    | 0.001               | 60                        | Sagadahoc    | 3.61                                                   | 0.27                     | \$232.80                      |
| Transmission Structures/Stations                                                                                                                                           | 0.019               | 842                       | Somerset     | 3.61                                                   | 0.04                     | \$3,073.30                    |
| <b>Total</b>                                                                                                                                                               | <b>2.218 Acres</b>  | <b>96,610 Sq. ft.</b>     |              |                                                        | <b>Total In-Lieu Fee</b> | <b>\$382,331.87</b>           |

<sup>1</sup> Resource multiplier of 1.

Table 1-5.6b ILF Compensation for USACE High Value Jurisdictional Vernal Pools

|                         |                      |                                          |                                 |                                 | Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier) <sup>1</sup> |                                                        |                          |                     |
|-------------------------|----------------------|------------------------------------------|---------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------|---------------------|
| NECEC Project Component | High Value Pools (#) | Multiplier x Standard Sq Ft <sup>2</sup> | HUC8 Watershed                  | Bailey and Keys Ecoregion       | County                                                                                                                                                                     | Natural Resource Enhancement and Restoration Cost (\$) | Assessed Land Value (\$) | In-Lieu Fee (\$)    |
| Transmission            | 26                   | 65,000                                   | NA                              | Central Maine Embayment         | Androscoggin                                                                                                                                                               | 3.61                                                   | 0.17                     | \$319,410.00        |
| Transmission            | 0                    | 65,000                                   | NA                              | Presumpscot River and Casco Bay | Cumberland                                                                                                                                                                 | 3.61                                                   | 0.69                     | \$0.00              |
| Transmission            | 4                    | 65,000                                   | NA                              | Foothills and Central           | Franklin                                                                                                                                                                   | 2.86                                                   | 0.03                     | \$37,570.00         |
| Transmission            | 0                    | 65,000                                   | NA                              | Interior                        | Kennebec                                                                                                                                                                   | 3.61                                                   | 0.16                     | \$0.00              |
| Transmission            | 4                    | 65,000                                   | NA                              | Midcoast Region                 | Lincoln                                                                                                                                                                    | 3.61                                                   | 0.3                      | \$50,830.00         |
| Transmission            | 0                    | 65,000                                   | NA                              | Midcoast Region                 | Sagadahoc                                                                                                                                                                  | 3.61                                                   | 0.27                     | \$0.00              |
| Transmission            | 13                   | 65,000                                   | NA                              | Western Mountains               | Somerset                                                                                                                                                                   | 3.61                                                   | 0.04                     | \$154,212.50        |
| Merrill Road Converter  | 2                    | 65,000                                   | Lower Androscoggin River        | Central Maine Embayment         | Androscoggin                                                                                                                                                               | 3.61                                                   | 0.17                     | \$24,570.00         |
| Fickett Road Substation | 0                    | 65,000                                   | Presumpscot River and Casco Bay | Casco Bay Coast                 | Cumberland                                                                                                                                                                 | 3.61                                                   | 0.69                     | \$0.00              |
| <b>Total No.</b>        | <b>49</b>            |                                          |                                 |                                 | <b>Total In-Lieu Fee</b>                                                                                                                                                   |                                                        |                          | <b>\$586,592.50</b> |

<sup>1</sup> Resource multiplier of 1 and an adjustment of 5%.<sup>2</sup> USACE 2016 Corps Mitigation Guidance: Standard of 13,000 sq.ft. x 5 for high value pools.



Table 1-5.6c ILF Compensation for USACE Medium Value Jurisdictional Vernal Pools

|                         |                        |                                          |                                 |                                 | Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier) <sup>1</sup> |                                                        |                          |                  |
|-------------------------|------------------------|------------------------------------------|---------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------|------------------|
| NECEC Project Component | Medium Value Pools (#) | Multiplier x Standard Sq Ft <sup>2</sup> | HUC8 Watershed                  | Bailey and Keys Ecoregion       | County                                                                                                                                                                     | Natural Resource Enhancement and Restoration Cost (\$) | Assessed Land Value (\$) | In-Lieu Fee (\$) |
| Transmission            | 55                     | 39,000                                   | NA                              | Central Maine Embayment         | Androscoggin                                                                                                                                                               | 3.61                                                   | 0.17                     | \$405,405.00     |
| Transmission            | 7                      | 39,000                                   | NA                              | Presumpscot River and Casco Bay | Cumberland                                                                                                                                                                 | 3.61                                                   | 0.69                     | \$58,695.00      |
| Transmission            | 10                     | 39,000                                   | NA                              | Foothills and Central           | Franklin                                                                                                                                                                   | 2.86                                                   | 0.03                     | \$56,355.00      |
| Transmission            | 1                      | 39,000                                   | NA                              | Central Interior                | Kennebec                                                                                                                                                                   | 3.61                                                   | 0.16                     | \$7,351.50       |
| Transmission            | 17                     | 39,000                                   | NA                              | Midcoast Region                 | Lincoln                                                                                                                                                                    | 3.61                                                   | 0.3                      | \$129,616.50     |
| Transmission            | 9                      | 39,000                                   | NA                              | Midcoast Region                 | Sagadahoc                                                                                                                                                                  | 3.61                                                   | 0.27                     | \$68,094.00      |
| Transmission            | 23                     | 39,000                                   | NA                              | Western Mountains               | Somerset                                                                                                                                                                   | 3.61                                                   | 0.04                     | \$163,702.50     |
| Merrill Road Converter  | 0                      | 39,000                                   | Lower Androscoggin River        | Central Maine Embayment         | Androscoggin                                                                                                                                                               | 3.61                                                   | 0.17                     | \$0.00           |
| Fickett Road Substation | 0                      | 39,000                                   | Presumpscot River and Casco Bay | Casco Bay Coast                 | Cumberland                                                                                                                                                                 | 3.61                                                   | 0.69                     | \$0.00           |
| Total No.               |                        | 122                                      |                                 |                                 |                                                                                                                                                                            | Total In-Lieu Fee                                      |                          | \$889,219.50     |

<sup>1</sup> Resource multiplier of 1 and an adjustment of 5%.<sup>2</sup> USACE 2016 Corps Mitigation Guidance: Standard of 13,000 sq.ft. x 3 for medium value pools.

Table 1-5.6d ILF Compensation for USACE Low Value Jurisdictional Vernal Pools

|                         |                     |                                          |                                 |                                 | Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier) <sup>1</sup> |                                                        |                          |                  |
|-------------------------|---------------------|------------------------------------------|---------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------|------------------|
| NECEC Project Component | Low Value Pools (#) | Multiplier x Standard Sq Ft <sup>2</sup> | HUC8 Watershed                  | Bailey and Keys Ecoregion       | County                                                                                                                                                                     | Natural Resource Enhancement and Restoration Cost (\$) | Assessed Land Value (\$) | In-Lieu Fee (\$) |
| Transmission            | 29                  | 13,000                                   | NA                              | Central Maine Embayment         | Androscoggin                                                                                                                                                               | 3.61                                                   | 0.17                     | \$71,253.00      |
| Transmission            | 0                   | 13,000                                   | NA                              | Presumpscot River and Casco Bay | Cumberland                                                                                                                                                                 | 3.61                                                   | 0.69                     | \$0.00           |
| Transmission            | 11                  | 13,000                                   | NA                              | Foothills and Central           | Franklin                                                                                                                                                                   | 2.86                                                   | 0.03                     | \$20,663.50      |
| Transmission            | 0                   | 13,000                                   | NA                              | Central Interior                | Kennebec                                                                                                                                                                   | 3.61                                                   | 0.16                     | \$0.00           |
| Transmission            | 6                   | 13,000                                   | NA                              | Midcoast Region                 | Lincoln                                                                                                                                                                    | 3.61                                                   | 0.3                      | \$15,249.00      |
| Transmission            | 0                   | 13,000                                   | NA                              | Midcoast Region                 | Sagadahoc                                                                                                                                                                  | 3.61                                                   | 0.27                     | \$0.00           |
| Transmission            | 22                  | 13,000                                   | NA                              | Western Mountains               | Somerset                                                                                                                                                                   | 3.61                                                   | 0.04                     | \$52,195.00      |
| Merrill Road Converter  | 3                   | 13,000                                   | Lower Androscoggin River        | Central Maine Embayment         | Androscoggin                                                                                                                                                               | 3.61                                                   | 0.17                     | \$7,371.00       |
| Fickett Road Substation | 0                   | 13,000                                   | Presumpscot River and Casco Bay | Casco Bay Coast                 | Cumberland                                                                                                                                                                 | 3.61                                                   | 0.69                     | \$0.00           |
| <b>Total No.</b>        | <b>71</b>           |                                          |                                 |                                 | <b>Total In-Lieu Fee</b>                                                                                                                                                   |                                                        | <b>\$166,731.50</b>      |                  |

<sup>1</sup> Resource multiplier of 1 and an adjustment of 5%.<sup>2</sup> USACE 2016 Corps Mitigation Guidance: Standard of 13,000 sq.ft. x 1 for low value pools.

Table 1-5.7 ILF Compensation for Permanent Wetland Fill in IWWH

| Permanent Wetland Fill in IWWH <sup>1</sup> |                     |                                        |                               |     |     |                                 |                                         | Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier) <sup>2</sup> |                                                        |                          |                  |
|---------------------------------------------|---------------------|----------------------------------------|-------------------------------|-----|-----|---------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------|------------------|
| NECEC Project Component                     | Total Acres of Fill | Resource Impact (sq. ft.) <sup>1</sup> | Cowardin Cover Type (Sq. Ft.) |     |     | HUC8 Watershed                  | Bailey and Keys Ecoregion               | County                                                                                                                                                                     | Natural Resource Enhancement and Restoration Cost (\$) | Assessed Land Value (\$) | In-Lieu Fee (\$) |
|                                             |                     |                                        | PEM                           | PFO | PSS |                                 |                                         |                                                                                                                                                                            |                                                        |                          |                  |
| Transmission                                | 0.000               | 0                                      | 0                             | 0   | 0   | NA                              | Central Maine Embayment                 | Androscoggin                                                                                                                                                               | 3.61                                                   | 0.17                     | \$0.00           |
| Transmission                                | 0.000               | 0                                      | 0                             | 0   | 0   | NA                              | Presumpscot River and Casco Bay         | Cumberland                                                                                                                                                                 | 3.61                                                   | 0.69                     | \$0.00           |
| Transmission                                | 0.000               | 0                                      | 0                             | 0   | 0   | NA                              | Western Foothills and Central Mountains | Franklin                                                                                                                                                                   | 2.86                                                   | 0.03                     | \$0.00           |
| Transmission                                | 0.000               | 0                                      | 0                             | 0   | 0   | NA                              | Central Interior                        | Kennebec                                                                                                                                                                   | 3.61                                                   | 0.16                     | \$0.00           |
| Transmission                                | 0.003               | 149                                    | 149                           | 0   | 0   | NA                              | Midcoast Region                         | Lincoln                                                                                                                                                                    | 3.61                                                   | 0.3                      | \$1,165.18       |
| Transmission                                | 0.000               | 0                                      | 0                             | 0   | 0   | NA                              | Midcoast Region                         | Sagadahoc                                                                                                                                                                  | 3.61                                                   | 0.27                     | \$0.00           |
| Transmission                                | 0.000               | 0                                      | 0                             | 0   | 0   | NA                              | Western Mountains                       | Somerset                                                                                                                                                                   | 3.61                                                   | 0.04                     | \$0.00           |
| Merrill Road Converter                      | 0.000               | 0                                      | 0                             | 0   | 0   | Lower Androscoggin River        | Central Maine Embayment                 | Androscoggin                                                                                                                                                               | 3.61                                                   | 0.17                     | \$0.00           |
| Fickett Road Substation                     | 0.000               | 0                                      | 0                             | 0   | 0   | Presumpscot River and Casco Bay | Casco Bay Coast                         | Cumberland                                                                                                                                                                 | 3.61                                                   | 0.69                     | \$0.00           |
| HDD Termination Stations                    | 0.000               | 0                                      | 0                             | 0   | 0   | NA                              | Western Mountains                       | Somerset                                                                                                                                                                   | 3.61                                                   | 0.04                     | \$0.00           |
| <b>Total</b>                                | <b>0.003 Acres</b>  | <b>149 Sq. ft.</b>                     |                               |     |     |                                 |                                         | <b>Total In-Lieu Fee \$1,165.18</b>                                                                                                                                        |                                                        |                          |                  |

<sup>1</sup> Wetlands within IWWH are WOSS. For purposes of evaluating compensation, WOSS impacts shown in Exhibit 1-4 exclude WOSS associated with IWWH.

<sup>2</sup> Resource multiplier of 2.



Table 1-5.8 ILF Compensation for Permanent Forested Wetland Conversion in IWWH

| Permanent Wetland Conversion in IWWH |                     |                           |                               |        |     |                                 |                                         | Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier) <sup>1</sup> |                                                        |                          |                     |
|--------------------------------------|---------------------|---------------------------|-------------------------------|--------|-----|---------------------------------|-----------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|--------------------------|---------------------|
| NECEC Project Component              | Total Acres of Fill | Resource Impact (sq. ft.) | Cowardin Cover Type (Sq. Ft.) |        |     | HUC8 Watershed                  | Bailey and Keys Ecoregion               | County                                                                                                                                                                     | Natural Resource Enhancement and Restoration Cost (\$) | Assessed Land Value (\$) | In-Lieu Fee (\$)    |
|                                      |                     |                           | PEM                           | PFO    | PSS |                                 |                                         |                                                                                                                                                                            |                                                        |                          |                     |
| Transmission                         | 0.000               | 0                         | 0                             | 0      | 0   | NA                              | Central Maine Embayment                 | Androscoggin                                                                                                                                                               | 3.61                                                   | 0.17                     | \$0.00              |
| Transmission                         | 0.000               | 0                         | 0                             | 0      | 0   | NA                              | Presumpscot River and Casco Bay         | Cumberland                                                                                                                                                                 | 3.61                                                   | 0.69                     | \$0.00              |
| Transmission                         | 0.590               | 25,705                    | 0                             | 25,705 | 0   | NA                              | Western Foothills and Central Mountains | Franklin                                                                                                                                                                   | 2.86                                                   | 0.03                     | \$44,572.47         |
| Transmission                         | 0.000               | 0                         | 0                             | 0      | 0   | NA                              | Central Interior                        | Kennebec                                                                                                                                                                   | 3.61                                                   | 0.16                     | \$0.00              |
| Transmission                         | 0.000               | 0                         | 0                             | 0      | 0   | NA                              | Midcoast Region                         | Lincoln                                                                                                                                                                    | 3.61                                                   | 0.3                      | \$0.00              |
| Transmission                         | 0.000               | 0                         | 0                             | 0      | 0   | NA                              | Midcoast Region                         | Sagadahoc                                                                                                                                                                  | 3.61                                                   | 0.27                     | \$0.00              |
| Transmission                         | 2.032               | 88,527                    | 0                             | 88,527 | 0   | NA                              | Western Mountains                       | Somerset                                                                                                                                                                   | 3.61                                                   | 0.04                     | \$193,874.13        |
| Merrill Road Converter               | 0.000               | 0                         | 0                             | 0      | 0   | Lower Androscoggin River        | Central Maine Embayment                 | Androscoggin                                                                                                                                                               | 3.61                                                   | 0.17                     | \$0.00              |
| Fickett Road Substation              | 0.000               | 0                         | 0                             | 0      | 0   | Presumpscot River and Casco Bay | Casco Bay Coast                         | Cumberland                                                                                                                                                                 | 3.61                                                   | 0.69                     | \$0.00              |
| HDD Termination Stations             | 0.000               | 0                         | 0                             | 0      | 0   | NA                              | Western Mountains                       | Somerset                                                                                                                                                                   | 3.61                                                   | 0.04                     | \$0.00              |
| <b>Total</b>                         | <b>2.622 Acres</b>  | <b>114,232 Sq. ft.</b>    |                               |        |     |                                 |                                         |                                                                                                                                                                            |                                                        | <b>Total In-Lieu Fee</b> | <b>\$238,446.60</b> |

<sup>1</sup> Resource multiplier of 1 and an adjustment of 60%.



**Table 1-5.9: ILF Compensation for Permanent Upland Fill in IWWH**

| Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier) <sup>1</sup> |                     |                           |              |                                                        |                          |                  |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------|---------------------------|--------------|--------------------------------------------------------|--------------------------|------------------|
| NECEC Project Component                                                                                                                                                    | Total Acres of Fill | Resource Impact (sq. ft.) | County       | Natural Resource Enhancement and Restoration Cost (\$) | Assessed Land Value (\$) | In-Lieu Fee (\$) |
| Transmission Structures                                                                                                                                                    | 0.005               | 199                       | Androscoggin | 0                                                      | 0.17                     | \$33.83          |
| Transmission Structures                                                                                                                                                    | 0.000               | 0                         | Cumberland   | 0                                                      | 0.69                     | \$0.00           |
| Transmission Structures                                                                                                                                                    | 0.002               | 79                        | Franklin     | 0                                                      | 0.03                     | \$2.37           |
| Transmission Structures                                                                                                                                                    | 0.000               | 0                         | Kennebec     | 0                                                      | 0.16                     | \$0.00           |
| Transmission Structures                                                                                                                                                    | 0.001               | 30                        | Lincoln      | 0                                                      | 0.3                      | \$9.00           |
| Transmission Structures                                                                                                                                                    | 0.000               | 0                         | Sagadahoc    | 0                                                      | 0.27                     | \$0.00           |
| Transmission Structures                                                                                                                                                    | 0.007               | 290                       | Somerset     | 0                                                      | 0.04                     | \$11.60          |
| Merrill Road Converter Station                                                                                                                                             | 0.000               | 0                         | Androscoggin | 0                                                      | 0.17                     | \$0.00           |
| Fickett Road Substation                                                                                                                                                    | 0.000               | 0                         | Cumberland   | 0                                                      | 0.69                     | \$0.00           |
| HDD Termination Stations                                                                                                                                                   | 0.000               | 0                         | Somerset     | 0                                                      | 0.04                     | \$0.00           |
| <b>Total</b>                                                                                                                                                               | <b>0.014 Acres</b>  | <b>598 Sq. ft.</b>        |              |                                                        | <b>Total In-Lieu Fee</b> | <b>\$56.80</b>   |

<sup>1</sup> Resource multiplier of 1.

**Table 1-5.10: ILF Compensation for Permanent Upland Conversion in IWWH**

| Wetland Compensation Formula: Sq. Ft. of Wetland Impacted X (Natural Resource Enhancement and Restoration Cost + Assessed Land Value) x (Resource Multiplier) <sup>1</sup> |                           |                           |              |                                                                     |                          |                    |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------|---------------------------|--------------|---------------------------------------------------------------------|--------------------------|--------------------|
| NECEC Project Component                                                                                                                                                    | Total Acres of Conversion | Resource Impact (sq. ft.) | County       | Natural Resource Enhancement and Restoration Cost (\$) <sup>2</sup> | Assessed Land Value (\$) | In-Lieu Fee (\$)   |
| Transmission Structures                                                                                                                                                    | 0.387                     | 16,877                    | Androscoggin | 0                                                                   | 0.17                     | \$1,721.45         |
| Transmission Structures                                                                                                                                                    | 0.000                     | 0                         | Cumberland   | 0                                                                   | 0.69                     | \$0.00             |
| Transmission Structures                                                                                                                                                    | 2.226                     | 96,966                    | Franklin     | 0                                                                   | 0.03                     | \$1,745.39         |
| Transmission Structures                                                                                                                                                    | 0.000                     | 0                         | Kennebec     | 0                                                                   | 0.16                     | \$0.00             |
| Transmission Structures                                                                                                                                                    | 0.000                     | 0                         | Lincoln      | 0                                                                   | 0.3                      | \$0.00             |
| Transmission Structures                                                                                                                                                    | 0.000                     | 0                         | Sagadahoc    | 0                                                                   | 0.27                     | \$0.00             |
| Transmission Structures                                                                                                                                                    | 9.773                     | 425,713                   | Somerset     | 0                                                                   | 0.04                     | \$10,217.11        |
| Merrill Road Converter Station                                                                                                                                             | 0.000                     | 0                         | Androscoggin | 0                                                                   | 0.17                     | \$0.00             |
| Fickett Road Substation                                                                                                                                                    | 0.000                     | 0                         | Cumberland   | 0                                                                   | 0.69                     | \$0.00             |
| HDD Termination Stations                                                                                                                                                   | 0.000                     | 0                         | Somerset     | 0                                                                   | 0.04                     | \$0.00             |
| <b>Total</b>                                                                                                                                                               | <b>12.387 Acres</b>       | <b>539,556 Sq. ft.</b>    |              |                                                                     | <b>Total In-Lieu Fee</b> | <b>\$13,683.95</b> |

<sup>1</sup> Resource multiplier of 1 and an adjustment of 60%.<sup>2</sup> For upland portions of IWWH, no restoration cost is associated with conversion impact to non-wetland resources.

**Table 1-5.11: Compensation for Conversion in Unique Natural Communities**

|                                |                                                                     |                           | Assessed Land Value x Resource Multiplier <sup>1</sup> |                                                        |                          |                       |
|--------------------------------|---------------------------------------------------------------------|---------------------------|--------------------------------------------------------|--------------------------------------------------------|--------------------------|-----------------------|
| NECEC Project Component        | Total Acres of Conversion with 250' Directional Buffer <sup>2</sup> | Resource Impact (sq. ft.) | County                                                 | Natural Resource Enhancement and Restoration Cost (\$) | Assessed Land Value (\$) | In-Lieu Fee (\$)      |
| Transmission Structures        | 0.000                                                               | 0                         | Androscoggin                                           | 0                                                      | 0.17                     | \$0.00                |
| Transmission Structures        | 0.000                                                               | 0                         | Cumberland                                             | 0                                                      | 0.69                     | \$0.00                |
| Transmission Structures        | 0.000                                                               | 0                         | Franklin                                               | 0                                                      | 0.03                     | \$0.00                |
| Transmission Structures        | 0.000                                                               | 0                         | Kennebec                                               | 0                                                      | 0.16                     | \$0.00                |
| Transmission Structures        | 0.000                                                               | 0                         | Lincoln                                                | 0                                                      | 0.3                      | \$0.00                |
| Transmission Structures        | 0.000                                                               | 0                         | Sagadahoc                                              | 0                                                      | 0.27                     | \$0.00                |
| Transmission Structures        | 87.848                                                              | 3,826,646                 | Somerset                                               | 0                                                      | 0.04                     | \$1,224,526.82        |
| Merrill Road Converter Station | 0.000                                                               | 0                         | Androscoggin                                           | 0                                                      | 0.17                     | \$0.00                |
| Fickett Road Substation        | 0.000                                                               | 0                         | Cumberland                                             | 0                                                      | 0.69                     | \$0.00                |
| HDD Termination Stations       | 0.000                                                               | 0                         | Somerset                                               | 0                                                      | 0.04                     | \$0.00                |
| <b>Total</b>                   | <b>87.848 Acres</b>                                                 | <b>3,826,646 Sq. Ft.</b>  |                                                        |                                                        | <b>Total In-Lieu Fee</b> | <b>\$1,224,526.82</b> |

<sup>1</sup> Resource multiplier of 8.<sup>2</sup> Permanent conversion impact to MNAP natural communities is 9.229 acres (402,008 sq.ft.). MNAP determined that it was appropriate to apply a 250' buffer in considering the area of which compensation would be provided. MNAP defined the 250' directional buffers for each occurrence, which totals the impact area presented in this table.

Table 1-5.12 Compensation for Conversion in Roaring Brook Mayfly and Northern Spring Salamander Conservation Management Areas

| Township            | County   | Stream Name                        | Feature ID      | Surveyed? (Y/N) | Species Present <sup>1</sup> | Clearing Impact within the Management Areas <sup>2</sup> (ac) | Clearing Impact (sq ft)  | Assessed Land Value (\$/sq ft) <sup>3</sup> | Resource Multiplier Applied to Fee <sup>4</sup> | Calculated Fee                              |
|---------------------|----------|------------------------------------|-----------------|-----------------|------------------------------|---------------------------------------------------------------|--------------------------|---------------------------------------------|-------------------------------------------------|---------------------------------------------|
| Skinner Twp         | Franklin | S. Branch Moose River              | PSTR-09-11      | Y               | RBM                          | 1.84                                                          | 80,107                   | 0.03                                        | 8                                               | \$19,225.64                                 |
| Skinner Twp         | Franklin | Trib to Bog Brook                  | PSTR-11-01      | Y               | NSS                          | 2.75                                                          | 119,659                  | 0.03                                        | 8                                               | \$28,718.24                                 |
| Appleton Twp        | Somerset | Trib to Bog Brook                  | PSTR-12-07      | Y               | NSS                          | 1.90                                                          | 82,590                   | 0.04                                        | 8                                               | \$26,428.72                                 |
| Appleton Twp        | Somerset | Gold Brook                         | PSTR-15-06      | Y               | RBM                          |                                                               |                          |                                             |                                                 |                                             |
| Appleton TWP        | Somerset | Trib. to Gold Brook                | PSTR-16-07      | N               | RBM                          |                                                               |                          |                                             |                                                 |                                             |
| Appleton TWP        | Somerset | Trib. to Gold Brook                | PSTR-16-10      | N               | RBM                          |                                                               |                          |                                             |                                                 | n/a, mitigation being proposed <sup>5</sup> |
| Appleton TWP        | Somerset | Trib. to Gold Brook                | PSTR-16-15      | N               | RBM                          |                                                               |                          |                                             |                                                 |                                             |
| Appleton Twp        | Somerset | Baker Stream                       | PSTR-17-07      | Y               | NSS                          | 3.10                                                          | 135,036                  | 0.04                                        | 8                                               | \$43,211.52                                 |
| Appleton Twp        | Somerset | Baker Stream                       | PSTR-17R-04     | Y               | NSS                          |                                                               |                          |                                             |                                                 |                                             |
| Bradstreet TWP      | Somerset | Unnamed Stream                     | PSTR-24-02      | N               | RBM/NSS                      | 0.06                                                          | 2,788                    | 0.04                                        | 16                                              | \$1,784.22                                  |
| Bradstreet TWP      | Somerset | Trib. to Horse Brook               | PSTR-26-05      | N               | RBM/NSS                      | 1.32                                                          | 57,456                   | 0.04                                        | 16                                              | \$36,771.61                                 |
| Johnson Mtn TWP     | Somerset | Mountain Brook                     | PSTR-33-01      | Y               | RBM/NSS                      |                                                               |                          |                                             |                                                 |                                             |
| Johnson Mtn TWP     | Somerset | Mountain Brook                     | PSTR-EM-34-01   | Y               | RBM/NSS                      |                                                               |                          |                                             |                                                 | n/a, mitigation being proposed <sup>5</sup> |
| Johnson Mtn TWP     | Somerset | Trib to Mountain Brook             | PSTR-EM-34-02   | Y               | RBM/NSS                      |                                                               |                          |                                             |                                                 |                                             |
| Johnson Mtn TWP     | Somerset | Trib. To East Branch Salmon Stream | PSTR-38-02      | Y               | NSS                          | 4.30                                                          | 187,308                  | 0.04                                        | 8                                               | \$59,938.56                                 |
| Johnson Mtn TWP     | Somerset | Trib. To East Branch Salmon Stream | PSTR-38-06      | Y               | NSS                          |                                                               |                          |                                             |                                                 |                                             |
| Johnson Mtn TWP     | Somerset | Trib. To East Branch Salmon Stream | PSTR-38-10      | Y               | NSS                          | 2.25                                                          | 97,792                   | 0.04                                        | 8                                               | \$31,293.50                                 |
| Johnson Mtn TWP     | Somerset | Trib. To East Branch Salmon Stream | PSTR-38-15      | Y               | NSS                          | 1.86                                                          | 80,891                   | 0.04                                        | 8                                               | \$25,885.09                                 |
| Johnson Mtn TWP     | Somerset | Trib. to Cold Stream               | PSTR-40-07      | N               | RBM/NSS                      | 4.08                                                          | 177,855                  | 0.04                                        | 16                                              | \$113,827.51                                |
| Johnson Mtn TWP     | Somerset | Trib. to Cold Stream               | PSTR-41-04      | N               | RBM/NSS                      |                                                               |                          |                                             |                                                 |                                             |
| Bradstreet TWP      | Somerset | Trib to Piel Brook                 | PSTR-SRD1-02    | N               | RBM/NSS                      | 1.48                                                          | 64,599                   | 0.04                                        | 16                                              | \$41,343.67                                 |
| Bradstreet TWP      | Somerset | Unnamed Stream                     | PSTR-SRD1-28-02 | N               | RBM/NSS                      | 1.48                                                          | 64,599                   | 0.04                                        | 16                                              | \$41,343.67                                 |
| Bradstreet TWP      | Somerset | Unnamed Stream                     | PSTR-SRD1-28-05 | N               | RBM/NSS                      |                                                               |                          |                                             |                                                 |                                             |
| <b>Total Impact</b> |          |                                    |                 |                 |                              | <b>26.416 Acres</b>                                           | <b>1,150,681 Sq. ft.</b> |                                             | <b>Total Fee</b>                                | <b>\$469,771.95</b>                         |

<sup>1</sup> For those streams outside of CMP's ownership and on lands which permission to survey was not granted from landowners, and unless the waterbody is hydrologically connected to another stream which presence/absence surveys were conducted, the presence of both species is assumed.

<sup>2</sup> The clearing impact includes the area extending 250 feet on both sides of the stream channel. The management areas were mapped according to "Notes on Mapping Protocol for Roaring Brook Mayfly Habitat Polygons in ETSC (12/22/10)" provided by MDIFW. This mapping protocol was applied to RBB and NSS waterbodies, as recommended by MDIFW. Where mapped management area polygons overlapped, the impact area was combined.

<sup>3</sup> Source: MDEP Fact Sheet- In Lieu Fee Compensation Program (rev 2017).

<sup>4</sup> On 11/8/2018, MDIFW recommended a resource multiplier of 8 be applied to the fee calculation for each species present, where both species are present a multiplier of 16 was applied.

<sup>5</sup> CMP will retain full height vegetation in the CMA's for these resources.





STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
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Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED DIRECT TESTIMONY AND EXHIBITS OF  
LAUREN JOHNSTON

Regarding

- Project Overview
- Issue 1: Scenic Character and Existing Uses
- Issue 2: Wildlife Habitat and Fisheries
- Issue 4: Compensation and Mitigation

February 28, 2019

**I. Qualifications of Witness (Relevant to DEP and LUPC Review)**

My name is Lauren Johnston and I am a Senior Environmental Scientist at Burns & McDonnell Engineering Company, Inc. (Burns & McDonnell). My curriculum vitae is attached

hereto as Exhibit CMP-4-A. I have been working on behalf of Central Maine Power Company (CMP) as a Senior Environmental Permitting Specialist for the New England Clean Energy Connect (NECEC) Project since April of 2017.

As part of the NECEC Project permitting team, I served a principal role in developing the state and federal permit applications and supplemental applications and interfaced on behalf of CMP directly with the regulatory agencies as part of the consultation process, application development and supplementation, and post-filing data requests. I am intimately familiar with the NECEC Project design and development, natural resources avoidance and mitigation measures, unavoidable natural resources impacts, and the compensation proposed for those unavoidable impacts. I have also served as a subject matter expert at three public information meetings at various locations in Maine.

I have been an environmental professional for 13 years, working with a variety of clients in the electrical transmission, wind power, and telecommunications industries. I obtained a Bachelor of Science in Natural Resource Studies, with minors in Resource Economics and Sociology, from the University of Massachusetts-Amherst in 2005 and became a Certified Professional in Erosion and Sediment Control (CPESC) in 2015. From 2006 to 2011, I was employed by EBI Consulting in Burlington, Massachusetts as an environmental scientist primarily conducting Phase I environmental site assessments, National Environmental Policy Act environmental reviews, and Section 106 of the National Historic Preservation Act consultation for the telecommunications and real estate industries. In 2011, I joined Burns & McDonnell in New Gloucester, Maine where I was an environmental specialist and construction compliance inspector as part of the program management team on CMP's Maine Power Reliability Program (MPRP). Since the completion of MPRP in 2015, the majority of my project work has been with



CMP where I oversaw permit and construction compliance on CMP's Lewiston Loop Project (2015-2018) and state and federal permit application development, submission, and post-filing support for the NECEC Project (2017-present).

**II. Discussion (Relevant to DEP and LUPC Review)**

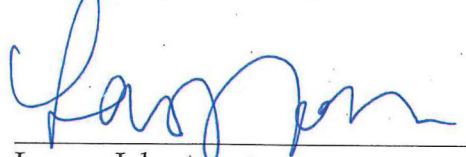
I hereby adopt the Pre-Filed Direct Testimony of Mark Goodwin as if it were my own, with the exception of his qualifications section.

Exhibits:

CMP-4-A: Johnston CV

Dated: 2/27/2019

Respectfully submitted,


  
\_\_\_\_\_  
Lauren Johnston

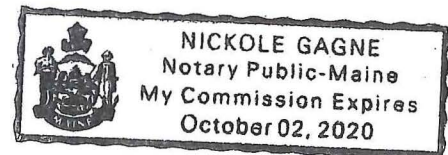
STATE OF MAINE  
CUMBERLAND, ss.  
COUNTY

The above-named Lauren Johnston did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Dated: 2/27/19

Before,

  
\_\_\_\_\_  
Notary Public  
Name: NICKOLE GAGNE  
My Commission Expires:





## LAUREN JOHNSTON, CPESC

### Senior Environmental Scientist



Lauren serves Burns & McDonnell as a senior environmental scientist in the Environmental Services division. She has more than 13 years of experience specializing in regulatory permitting, reporting and environmental compliance monitoring. Lauren has also completed numerous regulatory site assessments for a wide variety of properties and client types. A summary of her experience is provided below.

#### New England Clean Energy Connect | Central Maine Power

Portland, Maine | April 2017 – Present

**Senior environmental permitting specialist-** Lauren served a principal role in the preparation and filing of federal and state environmental permit applications for the New England Clean Energy Connect (NECEC) Project. The NECEC Project includes approximately 146.5-miles of High Voltage Direct Current (HVDC) transmission line and associated

substation facilities. Lauren worked closely with Central Maine Power and agency personnel to develop several aspects of the U.S. Department of Energy Presidential Permit for Border Crossings application, U.S. Army Corps of Engineers Individual Permit application, Maine Department of Environmental Protection (MDEP) Site Location of Development (Site Law) permit application, and MDEP Natural Resources Protection Act (NRPA) permit application. Under this effort, Lauren was a subject matter expert in three public information meetings at various locations in Maine. Lauren continues to provide permitting support services, including responses to agency information requests for Central Maine Power.

#### Bay State Wind Offshore Wind Farm Project | Bay State Wind, LLC Massachusetts, various locations | November 2018 - Present

**Senior environmental permitting specialist -** Lauren provided review and edits of draft sections of the Construction and Operations Plan, a requirement of the Bureau of Ocean Energy Management (BOEM) as part of the lease awarded to Bay State Wind, LLC. Bay State Wind, LLC is a joint venture between Ørsted and Eversource, which proposes to construct, own, and operate the Bay State Wind Offshore Wind Project within a 14-mile offshore lease area, approximately 12 miles south of Martha's Vineyard, Massachusetts. Onshore components consist of a transmission corridor, interconnection cable corridor, one new onshore substation site, and improvements to an existing National Grid substation, all located in Somerset, Massachusetts. Offshore design is anticipated to be up to 110 wind turbines, two offshore substations, an inter-array cable, and two export cables, located in the BOEM lease area and in state and federal waters. Lauren's review of the Construction and Operations Plan offered expert knowledge of the project design; federal, state and local regulatory requirements; and best management practices.

#### EDUCATION

- ▶ Natural Resource Management  
University of Massachusetts- Amherst,  
2005

#### REGISTRATIONS/CERTIFICATIONS

- ▶ Certified Professional in Erosion and Sediment Control (CPESC)
- ▶ Certification in Erosion and Sedimentation Control Practices- Maine DEP
- ▶ Adult CPR/AED
- ▶ Standard First Aid
- ▶ OSHA 30 hour CS&H

7 YEARS WITH BURNS & MCDONNELL

13 YEARS OF EXPERIENCE





## LAUREN JOHNSTON, CPESC

(continued)

### Footprint Salem Harbor Power Plant Project | Footprint Power Salem Harbor Development LP

Salem, Massachusetts | October 2018 - Present

*Environmental inspection services-* Lauren was responsible for monitoring compliance with environmental permits issued by various federal, state, and local regulatory agencies, specifically to actions associated with the EPA Remediation General Permit, Construction General Permit, and associated Stormwater Pollution Prevention Plan (SWPPP) and the Salem Conservation Commission Order of Conditions. The redevelopment plan for the Footprint Power Plant included demolition of the existing coal-fired electric generation facility and construction of a new Combined Cycle Gas (CCG) fired electric generation facility. The project site consists of approximately 65 acres, with approximately 20 acres being redeveloped as an electric generation facility. Inspections were conducted in accordance with regulatory and reporting requirements. Lauren regularly interfaced with the construction subcontractors to promote and confirm environmental compliance, specifically with remediation, erosion control, and mitigation measures during construction activities.

### Jericho Rise Wind Project | EDP Renewables NA Franklin County, New York | February 2017

*Environmental compliance services-* Lauren developed a construction environmental monitoring manual for the Jericho Rise Wind Project, which included the development of 37 turbines, a new substation, electrical collection lines and associated infrastructure. After a comprehensive review of project documents, permits, and plans, Lauren developed the compliance manual for use by the owner and developed pre-construction and construction compliance checklists. Lauren also assisted with the development of the environmental compliance training program that was presented to the project construction crew prior to the start of construction.

### Lewiston Loop Project | Central Maine Power New Gloucester, Maine | 2015 to 2018

*Environmental compliance coordinator and inspector-* Lauren provided environmental coordination and inspection on this multi-component upgrade to the Lewiston/Auburn area electrical transmission system. The project includes the construction of a new substation, six miles of 115kV overhead transmission lines, one mile of underground 115kV line through an urban area of Lewiston, decommissioning of an existing substation, and various other upgrades to the supporting grid. Lauren interfaced between the owner, contractors, and governmental agencies regarding permitting and environmental needs. Lauren provided weekly environmental inspections during construction of the various project components. In this role, Lauren was also responsible for preparing the MDEP Construction General Permit Notice of Intent and an application for a minor revision to the NRPA permit for the project.

### Maine Power Reliability Program | Central Maine Power New Gloucester, Maine | 2011 to 2015

*Environmental compliance inspector-* Lauren served as an environmental compliance inspector on this \$1.4 billion modernization of Maine's bulk power system. She coordinated preconstruction site walks and attended preconstruction meetings with agency staff, DEP third party inspectors, and involved contractors. The MPRP consisted of nearly 450 miles of linear transmission line construction, so Lauren's work involved variable site conditions and required knowledge of appropriate application of erosion and sediment controls and proper dewatering techniques. The MPRP included the construction of six new substations as well major upgrades to an additional six substations. Lauren provided environmental inspection of the stormwater system construction at many of these substation sites. She also reviewed restoration of the



## LAUREN JOHNSTON, CPESC

(continued)

project sites for final stabilization and established re-vegetation. Lauren worked closely with the client, contractors, and DEP third party inspectors to monitor project compliance.

### EBI Consulting\*

Burlington, Maine | 2006-2011

*Staff environmental scientist-* Lauren served as a staff environmental scientist, specializing in environmental investigations, site assessments, National Environmental Policy Act (NEPA) environmental reviews, and State Historic Preservation Office (SHPO) evaluation and submittals for the telecommunications industry. She conducted numerous pre-acquisition assessments/due diligence assignments for a wide range of properties throughout the northeast. The assessments were performed to evaluate site conditions, potential off-site liabilities, historic site and vicinity use, and site remediation recommendations to prospective buyers, owners, and operators. She performed sampling of soils, lead paint, and asbestos as part of her onsite field work.

*\*denotes experience prior to joining Burns & McDonnell*







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West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED DIRECT TESTIMONY AND EXHIBITS OF  
AMY BELL SEGAL

Regarding

- Issue 1: Scenic Character and Existing Uses
- Issue 3: Alternatives Analysis

February 28, 2019

**I. Qualifications of Witness (Relevant to DEP and LUPC Review)**

My name is Amy Bell Segal. I am a licensed landscape architect in Maine and a Senior Associate at Terrence J. DeWan & Associates. My twenty-six years of experience include visual impact assessments; recreation and trail planning; site design for commercial and industrial

properties; and permitting and construction management. During this time, I have gained considerable experience with energy-related projects, including over 20 wind projects, numerous transmission line upgrades, LNG pipeline and storage facilities, substations, solar installations, and quarry and landfill end use planning. My responsibilities for Central Maine Power Company's ("CMP's") Visual Impact Assessment ("VIA") for the New England Clean Energy Connect Project ("NECEC" or the "Project") include research, inventory, leading fieldwork, agency review meetings and site walks, overseeing production of modeling and photosimulations, and authoring the VIA report and supplemental submissions. I was also the project manager for the VIA for CMP's Maine Power Reliability Program ("MPRP"). My resume is attached as Exhibit CMP-5-A.

Terrence J. DeWan & Associates ("TJD&A") is one of three firms, and the only one in Maine, that are pre-qualified to perform peer reviews of visual impact assessments for the Maine Department of Environmental Protection ("MDEP"). Over the past four decades TJD&A has prepared close to 100 VIAs for a wide variety of projects throughout New England, including hydroelectric dams, port improvements, power generation facilities, electrical transmission lines, substations, liquefied natural gas facilities, industrial buildings, sanitary landfills, roads and bridges, mining operations, wind energy facilities, and new community development.

## **II. Purpose and Scope of Testimony (Relevant to DEP and LUPC Review)**

This testimony provides my assessment of the potential effect the Project may have on scenic and aesthetic uses. A presentation that illustrates my testimony is attached as Exhibit CMP-5-B. A compilation of our methodology and findings is attached as Exhibit CMP-5-C.

I conclude with my opinion that the Project will not unreasonably interfere with existing scenic and aesthetic uses, and does not diminish the public enjoyment and appreciation of the

qualities of the scenic resources, and any potential impacts have been minimized. The activity will not have an unreasonable impact on the visual quality of protected natural resources as viewed from a scenic resource. The development will not adversely affect scenic character. There are no practicable alternatives to the proposed activity that will have less visual impact, and there is no reasonable alternative to the outstanding river segment crossings that would have less adverse effect upon the natural and recreational features of these river segments. With respect to portions of the Project located in LUPC's P-RR subdistricts, the Project will be buffered from those uses within the vicinity or area likely to be affected by the proposal with which it is or may be incompatible, and there is no alternative site which is both suitable to the proposed use and reasonably available to CMP.

### **III. Summary of Testimony (Relevant to DEP and LUPC Review)**

#### **Visual Impact Assessment Overview**

The NECEC Project is a High Voltage Direct Current ("HVDC") transmission line and related facilities with the capacity to deliver up to 1,200 MW of electric generation, starting in Beattie Township at the Canadian Border and connecting to the New England Control Area through the new Merrill Road Converter Station and existing Larrabee Road Substation in Lewiston, Maine.

TJD&A prepared a VIA of the NECEC using standard visual impact assessment methodologies, following the standards described in the MDEP's Natural Resources Protection Act ("NRPA") Chapter 315 regulations, as well as addressing the standards in the Site Location of Development Law's applicable rule, Chapter 375.14 (Scenic Character). TJD&A also considered the criteria applicable to crossings of outstanding river segments, and buffering of the Project and alternatives to the Project within LUPC's P-RR subdistricts.

The NRPA and Chapter 315 require an applicant to demonstrate that a proposed activity will not unreasonably interfere with existing scenic and aesthetic uses of a scenic resource, as defined by Chapter 315. This regulation applies to activities in, on, over, or adjacent to a protected natural resource. More broadly, the Site Law and Chapter 375.14 require an applicant to demonstrate that the development will not have an unreasonable adverse effect on the scenic character of the surrounding area. Potential impacts to identified scenic resources, and other points of local sensitivity, have been assessed within each segment.

The VIA that we conducted for NECEC contains the elements that are common to all VIAs that are conducted for Maine regulatory agencies. We became very familiar with the viewshed area and the surrounding region; we identified scenic resources and the groups that use them that may be affected by the Project; we determined where the transmission line would be visible; we developed accurate photosimulations that enabled us to visualize and describe potential changes to scenic resources resulting from the transmission line's visibility; we presented recommendations to the design team on possible measures to avoid and minimize such impacts; and, finally, we determined whether the Project would have an unreasonable adverse effect on aesthetics.

The VIA describes in both a narrative and graphic form the changes to the visual environment that may result from the construction of the Project as well as the measures that have been and are being taken to avoid, minimize, and mitigate adverse visual effects. We determined the visual effects of the Project, based on our experience with objective criteria, to analyze potential contrast in color, form, line, texture, scale, and dominance between the existing landscape setting and the proposed Project components. The VIA evaluates effects on individual

scenic resources and provides the basis for rendering an overall judgment as to whether the Project as a whole would have an unreasonable adverse effect on aesthetics.

Our VIA is a systematic analysis of possible changes to the visible landscape resulting from the proposed NECEC, and the investigation of possible means to avoid, minimize, or mitigate the effects of the change. The methodology for preparing a VIA in Maine is guided by Chapter 315 and includes the following steps:

- Develop Project understanding
- Determine viewshed study Area of Potential Effect (“APE” also referred to as “Study Area”) based on viewing distances
- Research, inventory, and identify Scenic Resources
- Prepare Viewshed Analysis to determine potential Project visibility
- Perform fieldwork to document regional and local landscape character and site context
- Determine Project visibility from identified Scenic Resources
- Prepare photosimulations from key observation points and other identified locations
- Rate potential visual impacts based on evaluation of photosimulations and other analysis
- Determine sensitivity levels of user groups
- Determine Visual Impact
- Develop mitigation recommendations

#### **Scenic Resource Identification: Data Collection**

Prior to starting field investigations, TJD&A staff examined a wide variety of data sources to determine the location, extent, and significance of scenic resources within five miles of the Project corridor. Three to five miles is considered to be the outer of limit of the midground viewing distance; objects beyond this distance will only be visible if they have

significant contrasts in form or line. This outer limit was approved by the MDEP at the beginning of the VIA process, recognizing that the proposed activity would not have the potential to create an unreasonable adverse impact on scenic resources beyond the five-mile threshold. In many of the photosimulations, where the existing transmission line is located beyond five miles from the viewpoint, the proposed structures are not visible, and the additional 75 feet of clearing is barely recognizable.

Data sources included United States Geological Survey (“USGS”) maps; substation grading plans provided by engineering consultants; 3D PLS CADD models, cross-sections, and elevations provided by Project engineers; Maine Office of GIS; maps and other documentation from municipal comprehensive plans; Land for Maine’s Future Board; Maine Department of Agriculture, Conservation and Forestry (“MDACF”) information on state parks, wildlife refuges, and other state lands; Maine Department of Inland Fisheries & Wildlife (MDIFW) lake survey maps; Interconnected Trail Systems (“ITS”) maps; Maine Land Use Planning Commission; National Park Services’ National Natural Landmark program; The Nature Conservancy; The Trust for Public Land; The Forest Society of Maine; local/regional land trusts; National Register of Historic Places; Maine Historic Preservation Commission; Maine Lakes Study; Maine Wildlands Lake Assessment; Maine Rivers Study; DeLorme Atlas and Gazetteer; Google Earth; Maine Trail Finder; and other secondary data sources.

### **Viewshed Analysis**

TJD&A prepared a computerized viewshed analysis of the APE to identify locations that may have views of the Project. One of the primary purposes of the analysis was to guide fieldwork to scenic resources and other areas where there may be potential visibility.

Two types of viewshed analyses were created. A topographic viewshed analysis was

prepared using Digital Elevation Model (“DEM”) data from the USGS National Elevation Data (“NED”) website. This produced a Digital Terrain Model (“DTM”) ground surface model for the entire Study Area, which shows where any portion of at least one structure would be visible, if there were no trees, buildings, or other obstructions. While this is a highly exaggerated and unrealistic model, it does show where there is no possible Project visibility due to the screening effects of topography.

To gain a more realistic understanding of potential project visibility, an additional viewshed analysis was prepared to show the effect of tree cover and buildings on Project visibility. The DTM surface was converted to a Digital Surface Model (“DSM”) using Maine Land Cover Data Classifications from the Maine Office of GIS. A land cover height raster was developed using specific heights for land covers in the Study Area. This raster file was overlaid on the base map to indicate where Project visibility is unlikely due to the screening effects of 40-foot tall woody vegetation, which is a conservative height estimate.

### **Fieldwork**

TJD&A staff collected field data by driving, walking, hiking, boating, flying (float plane), and photographing the Study Area in order to assess visibility from scenic resources, public roads, trails, conservation lands, water bodies, and other publicly accessible viewpoints. We conducted our fieldwork from June 2017 to February 2019. Fieldwork was designed to visit and photograph scenic resources as well as characteristic landscapes in every segment. While the majority of the site visits were during the summer of 2018, additional fieldwork was completed during the late fall and winter of 2018 /2019 to evaluate many of the same landscapes during leaf-off conditions. Representative photographs of each segment are included in the VIA to document the field study, supplement the narrative, and provide additional context images for



the photosimulation locations.

Fieldwork typically involved teams of two people from TJD&A who visited, photographed, and analyzed the scenic resources and surrounding landscapes throughout the APE. Field visits were designed to provide us with first-hand knowledge of existing conditions at the identified resource, to evaluate the scenic quality of the resource, to observe human use patterns, to photograph views from key observation points (“KOPs”), and to record site conditions and other factors that may affect Project visibility.

For each site one member of the team photographed the landscape, using a high quality digital camera equipped with a GPS device that captured the location of each image.

Photographs were taken for several purposes: to document the characteristic landscape in the vicinity of the scenic resource; to provide images that illustrate the context of the viewpoint(s); and to record images that would be used in photosimulations. Photographs were taken from a number of viewpoints, depending on tree cover, evidence of public use, accessibility, and visibility of the existing and proposed transmission lines. The other member(s) of the site team reviewed maps and recorded observations on weather conditions, user activities, visibility of existing transmission line(s), and the character of the surrounding landscape.

Photographs used in the photosimulations were taken by TJD&A staff during field work with either a Nikon D7100 or Nikon D5500 digital camera, set to shoot at a focal length equivalent to a 50 mm (‘normal’) lens. The locations of all photographs were recorded with a GPS unit that allowed the image to be registered in the computer model.

### **Site Context**

The VIA describes the physical context of each segment in terms of existing land use patterns, vegetation cover, topography, and water bodies within the Study Area. The narrative

evaluates existing vegetative buffers (where present) and their effectiveness in screening the facilities within the corridor from nearby land uses and scenic resources. Representative photographs are included for each segment to supplement the narrative and illustrate the context of the Project. The VIA concentrated on views from publicly accessible scenic resources, primarily roads, trails, public lands, and water bodies.

### **Project Visibility / Distance Zones**

The concept of distance zones is based on the United States Department of Agriculture Forest Service's visual analysis criteria for forested landscapes. The concept is found in most governmental visual assessment systems and is based on the amount of detail that the human eye can differentiate at different distances and the experience people will have when they see human development in landscape settings. Distance zones provide a frame of reference for describing existing landscape conditions and evaluating the relative visibility of transmission lines from scenic resources, and therefore the visual effect they may have on those resources at varying distances. The distance zones used for the study of the NECEC Project are defined as:

- **Foreground** (within 1/2 mile from an observer). In the foreground, observers are able to detect surface textures, details, and a full spectrum of color. Examples of foreground views include locations where transmission lines cross public roads, streams, and rivers, or where substations are adjacent to public roads or other scenic resources.
- **Midground** (1/2 mile to 3 miles from an observer): In the midground, the details found in the landscape become subordinate to the patterns observed in the larger landscape as a whole. Individual trees lose their identities and become forests; buildings are seen as simple geometric forms; roads and rivers become lines. Development patterns are readily apparent, especially where there is noticeable contrast in scale, form, texture, or line.

Colors become somewhat muted (especially noticeable as the distance from the observer increases), an effect that is more pronounced in hazy or rainy weather conditions, which tend to reduce color intensity and de-sharpen outlines even further. In panoramic views, the midground landscape is the most important element in the composition in determining visual impact.

- **Background** (greater than 3 miles from an observer): Changes to the landscape seen at this distance are highly visible only if they present a noticeable contrast in form or line. In the background the effects of distance and haze will obliterate surface textures, detailing, and forms of individual structures. The effects of atmospheric haze can also significantly reduce visibility of clearings and structures. Most transmission structures and conductors cease to be uniquely recognizable at distances greater than 3 miles. Visual effects from the Project will primarily be from new or expanded corridor clearings, which present noticeable contrasts in color, form, and line.

### **Photosimulations**

Photographs are used extensively in the VIA to illustrate a) where views will not be altered by the Project; b) where post-construction views will include relatively small portions of the transmission structures and/or conductors; or c) where post-construction views may change more significantly. TJD&A has prepared an extensive series of photosimulations (computer-altered photographs) to illustrate the third situation. A total of 32 viewpoints from scenic resources (as defined in MDEP Chapter 315) and locally sensitive resources were selected for analysis and the development of photosimulations in the initial September 2017 Site Law Application. An additional 8 photosimulations were provided in the June 29, 2018 post-application submittal to MDEP. Finally, an addition 13 photosimulations were provided on

December 7, 2018 to illustrate leaf-off conditions throughout the Study Area.

Photosimulations were prepared by 1) creating a three dimensional DTM base of the Study Area landscape using National Elevation Data from USGS; 2) inserting three dimensional computer models of the proposed transmission structures generated in PLS CADD provided by Project engineers into the base model; 3) aligning the computer model of the Project with GPS located photographs in 3D Studio Max; 4) rendering a simulated perspective of the Project using 3D Studio Max; 5) exporting the resultant image into Photoshop and merging with the selected photograph to create a photorealistic representation; and 6) altering the vegetation in Photoshop to reflect new or widened corridor clearings, based on the limit of clearing information provided by project engineers.

Panoramic views were also created for each viewpoint by using several 'normal' photographs merged in Photoshop to provide a more contextual view of the landscape. These views are included as the title page for each location, along with a location map, a context map, a typical cross section, and technical information (viewpoint location, viewing direction, angle of view, date and time of photograph, camera focal length, camera type, photo source, number of proposed structures visible, and approximate distance to the nearest visible structure or corridor clearing).

### **Selecting Photosimulation Locations**

Photosimulations are provided to illustrate to the general public and the permitting agencies how the Project will appear. Since they are key to understanding potential visual impacts, it is important that the photographs selected for simulations be representative of the Project as a whole and that they give the reviewers an accurate picture of Project effects. The NECEC

extends for 145 miles through very diverse landscapes that include commercial forests, agricultural lands, rural villages, and urban communities.

The methodology that was employed to evaluate this Project is the standard professional practice referenced in Chapter 315.7 that TJD&A typically uses in preparing a VIA. The objective is to visit, analyze, and present data on representative sites within the APE. These are selected to illustrate a) the diversity of the scenic resources and viewing opportunities within the Study Area, b) characteristic views from scenic resources that visitors now encounter, and c) potential visual effects of the Project when viewed from the varied distances, elevations, and existing use patterns within the Study Area. TJD&A has identified and photographically documented representative worst-case viewpoints from all of the identified scenic resources.

Scenic resources and potential viewpoints are evaluated as either: **points** (e.g., scenic overlooks, mountaintops, historic structures), **lines** (e.g., scenic byways, river segments, hiking trails), or **areas** (e.g., lakes, historic districts, state parks). The methodology included a sampling of all these types of viewpoints and resources.

Selection of viewpoints at **point locations** are self-evident, i.e., there is typically a single viewpoint from a mountaintop or scenic overlook. Where there are a limited number of viewpoints, as is the case in most point locations, there is no distinction between representative and worst-case conditions.

With **linear resources** the decision as to where to evaluate and photograph considers many factors: direction of viewer travel; representative nature of the viewpoint; typical viewer experience; maximum potential Project visibility; amount of time that the project would be in view along the route; viewer speed and mode of travel; orientation of the viewer; other scenic/cultural features visible; etc.

In the case of **planar resources** the considerations as to where to evaluate and photograph is similar to linear resources: ability to move within the resource; concentration points of viewer activity (e.g., boat launches on a lake, a central green in a historic district, activity area in parks); varying degrees of impact at different viewpoints; maximum potential Project visibility (worst-case conditions initially guided by the viewshed analysis); viewer speed and mode of travel; focal points within the viewshed; other scenic/cultural features visible; etc.

For most linear and planar resources, TJD&A photographed the landscape from a number of viewpoints, guided by the viewshed map. Locations in the field were selected based on existing vegetation, elevation, evidence of public use, visibility of existing transmission lines, discordant features within the view, and other site-specific factors. The final selection of worst-case viewpoints used for the photosimulations considered many factors including, but not limited to: presence or absence of an existing transmission corridor; viewer elevation; distance from the observer; the number of structures visible in the photograph; and the amount of the structure(s) and conductors that may be visible based on the computer model.

**Moxie Pond** is a representative example of a planar resource. We first determined where the Project would be most visible, based on viewshed mapping. Field investigations helped us select and photograph representative viewpoints from the north end of the pond near the boat launch, and a worst-case viewpoint from the south end where the existing transmission line is most visible and where the Project would be most visible. **Route 201** is an example of a linear resource where we selected viewpoints based on viewshed mapping and fieldwork. The Attean View Rest Area, where the Project would be seen in the background, was selected as a representative view where people gather, while the location where the transmission line crosses the highway in Moscow was used as an example of a worst-case viewpoint. From elevated

viewpoints, such as **Coburn Mountain**, we selected a point with the most potential Project visibility and highest degree of apparent use, based on viewshed mapping, field observation, and guidebook research.

During the course of the fieldwork for NECEC, TJD&A visited hundreds of sites throughout the Study Area and collected thousands of photographs to illustrate existing conditions. The fieldwork concentrated on the scenic resources that were identified during the office research phase of the visual analysis, i.e., those public natural resources or public lands visited by the general public, in part for the use, observation, enjoyment, and appreciation of natural or cultural visual qualities, generally within three miles of the transmission corridor. Since it would be virtually impossible to use every photograph, or to portray the potential effect of the Project on every scenic resource, TJD&A used the following filtering process to select a representative sampling to use as the basis for photosimulations.

- **Segments.** The number of photosimulations should be roughly proportional to the length of each of the five segments that were identified. Segment 1 (new 53.5 mile HVDC line) has 16 simulations (including 4 at the Kennebec Gorge); Segment 2 (22 miles of co-located HVDC line) has 11 simulations (including 3 at the Appalachian Trail); Segment 3 (70 miles of co-located HVDC line) has 6 simulations; Segment 4 (25.4 mile rebuild section) has 2 simulations; and Segment 5 (26.5 mile 345 kV section) has 5 simulations.
- **Scenic Resources.** Photosimulations should be provided at the most significant scenic resources identified by TJD&A and DEP throughout the Study Area. The simulations should include views from great ponds, rivers and streams, mountain peaks, scenic byways, and other scenic resources.



- **Landscape Diversity.** Simulations should include views of characteristic landscapes within each of the segments to illustrate the diversity of landscapes, vegetation types, water bodies, landforms, and settlement patterns found throughout the Study Area.
- **Viewing Distances.** The majority of the photosimulations (approximately 70-75%) should be within the foreground viewing distance (up to 0.5 mile from the observer), and approximately 20-25% should be in the mid-ground (between 0.5 mile and 3.0 miles). Background views (beyond 3 miles) should illustrate those places where the transmission corridor might be visible from significant viewpoints, based on field identification.
- **Elevations.** The simulations should include views from relatively level areas as well as elevated viewpoints, assuming that the latter category will be mostly in the mid-ground and background viewing distances.

TJD&A selected an initial collection of photographs from the fieldwork to represent the geographic diversity of the Study Area, with particular attention to those areas where post-construction views may be most noticeable. The filtering process outlined above was used to focus on the most significant candidate sites and photographs. In making the final selection, the process also considered whether the scenic resources were either: points (e.g., scenic overlooks, mountaintops, historic structures), lines (e.g., scenic byways, river segments, hiking trails), or areas (e.g., lakes, historic districts, state parks).

As part of the VIA we prepared a Photosimulation Summary in matrix form that categorizes each photosimulation by distance zones (foreground, midground, background), viewpoint type/scenic resource (rated waterbodies, remote ponds, elevated viewpoints, recreation areas/parks/trails, scenic byway, and road crossing), and surrounding land use (commercial working forestland, non-forested land/agriculture, low density rural residential/camps along

ponds, and village/suburban residential). As evidenced by the matrix, the viewpoints selected provide the reviewer with an understanding of the diversity of the landscape and the potential effect that the Project may have on representative and worst-case viewpoints.

### **Visual Impact Assessments**

TJD&A developed a VIA for each of the five Project segments and the substations to evaluate potential impacts on scenic resources and existing public scenic and aesthetic uses. The evaluation is based on knowledge of the Project gained from fieldwork, background research, viewshed analysis, resource mapping, and a review of the photosimulations and other data sources.

The narrative for each segment follows the MDEP Chapter 315 regulations, starting with the completion of the MDEP Basic Visual Impact Assessment Form (VIA Form) to determine the potential visual effect of the Project on scenic resources. The VIA Form is based on an evaluation of the Project's visual elements (i.e., landscape compatibility, scale contrast, and spatial dominance). The narrative also includes a description of the a) significance of scenic resources based on state or local designations and b) visual quality observed during field visits (landform, vegetation, water bodies, color, views, human development and character.)

Observations and researched data are provided, when available, to address user expectation of scenic quality; extent, nature, and duration of public use; and continued use and enjoyment. The following two questions were asked for each identified resource: 1) will the Project affect the way the scenic resource is currently being used, and 2) will the Project have an effect on the public's enjoyment of the resource?

The sections *in italics* below are quotes from the Chapter 315 regulations:

***Landscape compatibility***, which is a function of the sub-elements of color, form, line, and

*texture. Compatibility is determined by whether the proposed activity differs significantly from its existing surroundings and the context from which they are viewed such that it becomes an unreasonable adverse impact on the visual quality of a protected natural resource as viewed from a scenic resource.*

Each sub-element is evaluated for how compatible the change resulting from the NECEC activity will be with its surroundings and whether there will be no, minimal, moderate, strong, or severe contrast.

**Color:** This section describes anticipated color contrasts between existing conditions and proposed materials to be used for the Project. Moderate contrasts in color may occur in segments that use self-weathering steel structures, which are typically darker in color than weathered wooden poles that are light gray in color. Where no other structures exist, the self-weathering steel may be more similar in color to surrounding wooded landscape. Most of the electrical equipment used in substations will be galvanized, which should match the existing equipment used in adjacent substations.

**Form:** The form (three-dimensional shape) of the transmission structures being proposed are similar to single pole structures currently found in transmission line corridors. The new transmission structures are expected to result in minimal to moderate contrasts in form with the surrounding trees and existing transmission structures.

**Line:** The VIA describes the anticipated changes to the landscape resulting from the introduction of new linear elements in the landscape, i.e., new or expanded transmission corridors, conductors, and transmission structures. The degree of contrast in line is a function of the distance from the observer, the relative length of the structure that is visible above the horizon, and the magnitude of other new lines introduced into the

landscape. Substations are typically composed of very linear elements – vertical, horizontal, and angular components – in addition to the lines of the conductors entering the facility. In the existing substations where new equipment will be added, there should be minimal to moderate contrast in line, depending on whether the new components will be visible above the horizon. New substations could have a moderate to strong contrast between the lines found in nature and the lines introduced by the substation.

**Texture:** The HVDC structures will be single pole self-weathering steel, which has a smoother (and darker) texture than the standard wooden poles. There may be moderate contrasts in texture in situations where the HVDC structures are viewed adjacent to wooden structures. The standard wooden structures have a texture similar to the existing H-frame poles and monopoles used throughout the corridors. There is generally no contrast in texture for new transmission structures made of the same material. The texture of the improved substations should be similar to the existing facilities, so there should be virtually no contrast in texture. In the case of new substations, the electrical equipment could have a moderate to strong contrast in texture with the surrounding vegetation and abutting land uses.

*Scale contrast is determined by the size and scope of the proposed activity given its specific location within the viewshed of a scenic resource.* The VIA describes the change in scale between the existing and proposed transmission structures, how the structures fit into the maintained corridor, and how they relate to the size of trees that line the corridor (where appropriate). The VIA describes the relative size of the new or upgraded substations in comparison to their surroundings (transmission structures, existing trees, nearby buildings, or other adjacent land uses). The VIA also describes whether the substation components will be

visible above the surrounding trees.

***Spatial Dominance** is the degree to which an activity dominates the whole landscape composition or dominates landform, water, or sky backdrop as viewed from a scenic resource.*

The VIA describes whether the proposed transmission line(s) or substations dominate or are prominent in the whole landscape composition, or dominates the surrounding landforms, nearby water bodies, or the sky. It also determines if any of the transmission structures (vertical lines) or conductors (horizontal lines) will be seen against the sky from prominent viewpoints or scenic resources. Spatial dominance also considers the presence or absence of screening vegetation between observers and the transmission structures or substations, the type and character of viewpoints (both roadside and from scenic resources), and the relative number of viewers and their respective sensitivity. The dominance of the Project components is described in terms of its relative prominence in the landscape: insignificant; subordinate to the surrounding natural and cultural elements in the landscape; co-dominate the landscape; or dominate the landscape, the immediate setting, or the backdrop.

## **Evaluation**

The severity of potential visual impact is based on Landscape Compatibility (color, form, line, and texture), Scale Contrast, and Spatial Dominance to determine whether the visual impact will be negligible, moderate, strong, or severe. The evaluation is based on first-hand knowledge of the specific site; a review of site photography and aerial photographs; Project design parameters for the individual transmission lines (cross-sections, areas of tree clearing) and substations; and photosimulations of the transmission lines.

#### **IV. Discussion (Relevant to DEP and LUPC Review)**

##### **a. Issue 1 (Scenic Character and Existing Uses)**

##### **i. Visual Impact Assessment and Scenic/Aesthetic Uses, Recreational and Navigational Uses (Relevant to DEP and LUPC Review)**

#### **Project Planning and Siting**

Minimizing potential visual and other environmental impacts on scenic and other natural resources was a key driver in the evaluation of route options. CMP's rigorous approach to siting considered a wide range of factors, including: ownership patterns, conserved lands, stream crossings, location of existing rights of way, clearing requirements, transmission line length, mapped wetlands (NWI data), deer wintering areas, inland waterfowl and wading bird habitats, public water supplies, and significant sand and gravel aquifers.

In siting Segment 1, CMP considered the presence of publicly owned conservation lands (e.g., the Appalachian National Scenic Trail and Maine Bureau of Parks and Lands properties) as well as those held by private conservation organizations such as The Nature Conservancy and the New England Forestry Foundation. The paramount goal of the route selection was to avoid iconic scenic and recreational areas that characterize this part of western Maine, including the Bigelow Preserve, the Crocker Mountain High Peaks area, Mount Abraham, Saddleback Mountain, the Moosehead Region Conservation Easement, Grace Pond in Upper Enchanted TWP, the Leuthold Forest Preserve, the Number 5 Bog Ecological Reserve, and the Moose River/Attean and Holeb Ponds. Care was also taken to site the new corridor and individual transmission structures to avoid visual impacts to smaller but visually sensitive areas such as the Moxie Falls Scenic Area and the Cold Stream Forest.

**Landowner Requirements.** Siting also considered specific landowner requirements. For example, Spencer Road is a private road owned by Weyerhaeuser Co. and is actively used for

timber harvesting and transporting. Weyerhaeuser required the proposed corridor to be located away from the road to allow room for future harvesting operations and lay down areas. CMP sited Segment 1 to the north of the road to comply with Weyerhaeuser's request, which resulted in a substantial buffer between the Project and recreational users/camp owners who also use the road to access Grace Pond, Fish Pond, and Spencer Lake.

**Lakes and Ponds.** There are approximately 48 lakes and ponds within 3 miles of Segments 1 and 2. The Project corridor was sited to avoid visual impacts to the extent possible to the 9 lakes and ponds rated for Scenic Resources in the Maine Wildlands Lake Assessment. Of these rated water bodies in Segments 1 and 2, five will have some views of the Project (Rock Pond, Fish Pond, Parlin Pond, Moxie Pond, and Wyman Lake).

**Old Canada Road Scenic Byway.** Route 201 is designated as the Old Canada National Scenic Byway; 49 miles of the Byway are within five miles of the Project. Many steps were taken to site Segment 1 to minimize visibility and potential impact to the Byway. For example, the crossing location selected was between Weyerhaeuser's Capitol Road and Judd Road, near the existing Jackman tie line transmission line corridor, in order to cluster transmission and transportation corridors. On Coburn Mountain the transmission corridor was sited in a pronounced notch to minimize visibility when viewed from the highway. As a result of this careful planning, the Project will be intermittently visible for only up to 95 seconds for northbound motorists and up to 48 seconds for southbound traffic traveling at 45 MPH.

**Appalachian Trail.** Locating the new transmission line in the vicinity of the AT required similar careful siting. The transmission line route is within an existing transmission line corridor where it will be co-located with an existing transmission line adjacent to Joe's Hole at the southern end of Moxie Pond. CMP has owned the land that the AT is located on in this area



since circa 1950. CMP conveyed an easement to the National Park Service for the AT but retained fee ownership and reserved the right to construct overhead transmission and communication lines within the entire 300-foot wide corridor.

### **Mitigation Measures**

Mitigation is defined as any action taken or not taken to avoid, minimize, rectify, reduce, eliminate, or compensate for actual or potential adverse environmental impact. A significant number of mitigation measures have been incorporated into the planning and design of the Project, including:

- **Selecting a project route** in Segment 1 that avoids the majority of the sensitive scenic resources that gives this area a distinctive character.
- **Using Horizontal Directional Drilling (HDD)** to go under the Upper Kennebec River to avoid visual impacts to a segment of the river that has been designated as an Outstanding River Segment. The river is a recreational resource used by whitewater rafters/kayakers and anglers. This measure will fully preserve the aesthetic character of this section of the Kennebec River by eliminating views of an overhead transmission line and warning balls that would have been visible to recreational users of the river. The HDD work has been designed so none of the activities associated with the drilling (i.e., the Moxie Gore and West Forks Termination Stations) will be visible from the river. TJD&A developed computer models to illustrate how existing vegetation and topography will prevent views of the Project from the river.
- **Locating the HVDC transmission line in Segment 1 in private timberland**, which has been – and continues to be – actively harvested.

- **Co-locating the HVDC transmission line** in an existing corridor in Segments 2 and 3 to minimize the amount of new corridors that would be required for the installation of the Project, rather than acquiring and developing an entirely separate transmission line corridor. This co-location strategy significantly reduces potential visual impacts.
- **Using weathering steel** monopole structures to minimize visual contrast, especially when viewed from elevated viewpoints and where the structure is seen against a wooded backdrop. Weathering steel monopoles are generally darker in color and have a hue that is more commonly found in the landscape, resulting in a decrease in color contrasts with the surrounding landscape. Monopole structures are simpler in appearance than traditional lattice structures, thus reducing the contrast in form. Monopole structures are also considerably thinner than lattice structures (i.e., they occupy a smaller horizontal field of view) so they will appear less dominant than lattice structures. This is particularly effective in Segment 1, where the majority of the transmission line will be seen in the context of commercial timberland.
- **Use of non-specular conductors** at Rock Pond to reduce potential glare from conductors for users of the pond
- **Reducing the structure heights** in a section of the Project adjacent to the existing corridor west of Moxie Pond and in proximity to Beattie Pond to minimize Project visibility.
- **Maintaining vegetation** at road crossings where possible by careful layout of access roads and monitoring of construction practices during installation to minimize or screen the view down transmission corridors. There are many areas where favorable growing conditions and CMP's maintenance procedures have resulted in effective stands of non-

capable species near the roadside that act as visual buffers. (Non capable vegetation is not capable of achieving a height tall enough to interfere with the electrical conductors.)

Clear paths will be left for inspection and maintenance.

- **Preserving riparian vegetation** at river and stream crossings to minimize views down transmission corridors from the water. Riparian vegetation likewise has to be non-capable, i.e., it cannot be capable of achieving a height tall enough to interfere with the electrical conductors.
- **Locating transmission structures** as far back from the edge of rivers, streams, and other areas of visual and/or habitat sensitivity to the greatest extent possible to minimize the scale of the structures relative to the heights of the surrounding trees.
- **Making the most effective use of existing transmission corridors** and rebuilding existing transmission lines in Segment 4 and locating a 345kV transmission line between two existing transmission lines in Segment 5 to minimize additional clearing and the need for land acquisition.
- **Upgrading existing substations** within the existing facility footprint to minimize the need for additional clearing.
- **Developing buffer screening plans** for the crossings of Route 201 (in Johnson Mtn twp and Moscow), Moxie Stream, Troutdale road/Appalachian Trail, and at the Fickett Road substation.
- **Siting the Merrill Road Converter Station** to avoid visibility from public roads. The preserved vegetation around the station will screen it from view from Merrill Road.

### Site-Specific Mitigation

In many instances, CMP analyzed site-specific measures to address situations where the Project may affect scenic resources within the foreground or near midground. Some examples include:

- **Rock Pond.** The initial photosimulation indicated that the clearing required for the proposed transmission corridor would cause significant contrast in color, form, line, and texture within a portion of the view looking north from the pond. After developing and evaluating several alternatives, CMP determined that it would propose tapering of the vegetation within the transmission corridor, maintaining trees and shrubs at heights ranging from 15 to 35 feet rather than removing all trees and shrubs. Specifically, trees would be maintained up to 35 feet in height at the outer edge of the corridor, tapering down to vegetation maintained at 10 to 15 feet directly under the conductors. The overall effect is a softening of the cut profile as viewed from the lake and the retention of vegetation of similar color and texture as the surrounding landscape. This is demonstrated in Photosimulation 3 from Rock Pond. Non-specular conductors are also being proposed for the conductors located along the north side of Rock Pond to minimize potential glare from the sun for users on the pond.
- **Coburn Mountain.** From the observation tower at the summit of Coburn Mountain, the proposed HVDC transmission line will be visible in the midground and background viewing distances in context with active timber harvesting operations. While the closest HVDC structure would be one mile from the summit, the most visible component of the Project would be the 2.2-mile portion of the 150-foot-wide corridor clearing on the shoulder of Johnson Mountain. To minimize the potential visual impact in both leaf-on

and leaf-off conditions to recreational users (primarily snowmobilers), CMP has proposed to utilize tapered vegetation management (as described for Rock Pond) for the visible portion of the corridor. Also, through the use of self-weathering steel, the structures will blend with the working forest landscape on either side of the corridor.

- **Beattie Pond.** By re-engineering the transmission structures near Beattie Pond, the height of the closest structure (3006-794) has been reduced by approximately 39 feet below the structure height shown on the September 2017 original submission. While a small portion of the top of the structure will still be visible above the treeline from a few areas on the pond, the structure will not appear above the skyline and will therefore be considerably less visually prominent, if it is noticeable at all. The top of Structure 3006-793 will be seen directly behind Structure 3006-794 from this viewpoint on the pond. Also, as a result of the re-engineering, a smaller portion of Structure 3006-795 will be visible above the treeline. In total, the tops of three HVDC structures and their shield wires will be visible just above the treeline, but will no longer be seen against the sky. The self-weathering steel used for the structures will minimize contrasts with the surrounding wooded hillside. Existing topography and shoreline vegetation will screen the rest of the Project from view. The re-engineered design will result in a reduced overall visual impact from the Pond and, as a result, the Project will be minimally noticeable from recreational users on the pond.
- **Moxie Pond.** After the initial photosimulations were developed from two locations on Moxie Pond, it was determined that the tops of numerous structures would be visible from the majority of Moxie Pond. Because the Pond is a designated scenic resource with an ‘Outstanding’ rating in the Maine Wildlands Lake Assessment, we recommended

CMP and the Project engineers consider a redesign to reduce the overall average structure heights. As a result of the re-design, the majority of the structures and conductors will be screened from the pond by shoreline vegetation. Portions of the widened corridor will continue to be visible in two areas of the pond where the existing corridor is already visible; at the southern end north of Joes Hole and near Black Narrows.

### **Cumulative Visual Effects**

Cumulative visual impact is the effect of seeing the Project from multiple viewpoints or multiple scenic resources (sequential observation). When evaluating the potential for cumulative impacts, we primarily consider the distance and travel time between viewpoints, and other forms of development that may affect the user's expectation for a particular scenic resource.

- **Appalachian National Scenic Trail.** The Project would be visible from three general areas that are part of the Appalachian Trail: the summit of Pleasant Pond Mountain, from which it will be seen intermittently at a distance of 2.9 to 7 miles; the site near Joe's Hole/Moxie Pond (3.6 miles from Pleasant Pond Mountain) where the AT crosses the existing transmission corridor in three locations; and Bald Mountain (4.0 miles from Moxie Pond), where the Project will be visible at distances of 2.8 to 7.5 miles. The Project will be minimally visible from the summits of both Pleasant Pond Mountain and Bald Mountain. Project impacts would be most noticeable adjacent to the co-located section crossings where the cleared corridor will increase from 150 feet to 225 feet in width. The cumulative visual impact on the AT will be minimal.
- **Route 201 (Old Canada Road National Scenic Byway).** The Old Canada Road Scenic Byway extends for a total of 78 miles from Madison to Jackman. While 49 miles of the Project are within 5 miles of the Byway, it will be visible in only four locations over a

distance of 30 miles: a) Johnson Mtn Twp, where it crosses the Byway, b) a 1,000-foot section west of Parlin Pond, c) the Attean View Rest Area, and d) a second crossing near Wyman Dam in Moscow. The distances between these four viewpoints are 6.2 miles, 6.7 miles, and 17.1 miles. The cumulative impact of these occasional views of the Project will be minor, given the relatively minor visual effect at each occurrence, the distances between each occurrence, and the working forest context in which they occur.

## **ii. Buffering for Visual Impacts (Relevant to DEP and LUPC Review)**

### **Road Buffer Evaluation**

The VIA describes the physical context within each Segment in terms of land use, vegetation patterns, land form, and water bodies adjacent to the transmission line corridor or substation site. The narrative evaluates existing vegetative buffers where present and their effectiveness in screening the facilities within the corridor from nearby land uses and scenic resources.

There are many areas where favorable growing conditions and CMP's maintenance procedures have resulted in effective stands of non-capable species near the roadside, which act as visual buffers. Wherever practicable, existing vegetation will be preserved within the transmission line corridor by careful layout of access roads and monitoring of construction practices during the installation process.

As a supplement to the VIA, TJD&A evaluated the need for buffer plantings on all roads that would be crossed by the Project. The NECEC Project Road Buffer Evaluation resulted in a determination of where visual buffers would be appropriate and effective. The Evaluation considered a number of factors: type of road, degree of visible change that would result, length of time a motorist would be exposed to the Project, existing screening, corridor visibility at the



crossing location, scenic quality, community character, land use within the corridor, environmental or other factors that could limit the ability to install buffers, appropriateness, existing scenic views, and potential benefits.

In some situations, removing roadside vegetation could be considered beneficial if it opens up more distant views to mountains or water bodies. The final determination of whether to use vegetative screening considers a range of factors on a case-by-case basis; the decision is not a simple If/Then type of analysis.

This process evaluated 46 crossings in Segment 1 (all but Route 201 and Lake Moxie Road were private); 21 crossings in Segment 2 (7 were public, the rest were private roads; 76 crossings in Segment 3 (14 were private, the rest public); 25 crossings in Segment 4 (all public roads); and 25 crossings in Segment 5 (all public roads.) The NECEC Project Road Buffer Evaluation resulted in recommendations for roadside buffers at the following areas.

- Where the Project crosses Route 201 in Johnson Mountain TWP, due to its designation as a National Scenic Byway and high traffic volume.
- Where the Project crosses Troutdale / Trestle Road near Joe's Hole in Moxie Pond in Bald Mountain Twp. At this location the Appalachian National Scenic Trail is co-located with Troutdale Road. Buffer plantings will be installed to partially screen the widened transmission corridor for hikers on the Appalachian Trail.
- On the south side of Fickett Road in conjunction with the Fickett Road Substation to minimize adverse effects on the scenic character of the surrounding area.

### **Converter Station and Substations**

In addition to the new Merrill Road Converter Substation, several substations will require the installation of additional equipment as part of the NECEC Project. The VIA examines

whether the components for both new and improved substations will be visible above the surrounding forest cover or from public viewpoints. The VIA takes into consideration the presence of existing trees, topography, or other natural or man-made features that would block the view of the facility. The VIA also recognizes the potential of visual buffer plantings and earthen berms in certain locations to minimize the visual impact of the substations by reducing its visible mass and introducing naturalistic forms in the immediate foreground. The VIA evaluated each location to determine if additional buffer plantings or other measures were required to minimize potential visual impacts.

- **Coopers Mills Substation, Windsor.** The infrastructure for the NECEC Project will be sited within the existing Coopers Mills substation. No additional tree removal will be required. Earth berms and preserved vegetation provide partial screening of the facility from Coopers Mills Road.
- **Crowley Road Substation, Lewiston.** The NECEC Project involves an upgrade within the existing Crowley Road substation. No additional tree removal will be required.
- **Larrabee Road Substation, Lewiston.** The infrastructure for the NECEC Project will be sited within the existing Larrabee Road Substation facility. No additional tree removal will be required. Buffer plantings have been installed and provide partial screening of the facility from the end of Larrabee Road. Vegetation surrounding the Substation will screen the NECEC Project components from most public views.
- **Merrill Road Converter Substation, Lewiston.** The Converter Substation is sited in a wooded area that provides the opportunity to preserve a significant vegetative buffer on all sides where there is minimal potential for public viewpoints or roads.
- **Raven Farms Substation, Cumberland.** The proposed NECEC components will be

located within a cleared/developed area west of the existing Raven Farms Substation. No additional tree removal will be necessary. Existing earthen berm and buffer plantings will screen the majority of the expansion from Greely Road.

- **Surowiec Substation, Pownal.** The infrastructure for the NECEC Project will be an expansion of the existing Surowiec Substation. Buffer plantings screen a portion of the Substation.
- **Fickett Road Substation, Pownal.** This substation has been sited within a landscape filled with electrical infrastructure in an area that requires minimal additional clearing. Buffer plantings will be installed on the south side of Fickett Road to minimize adverse effects on the scenic character of the surrounding area. This additional buffer will also minimize views of the Surowiec Substation. Buffer plantings will take into consideration the need for proper setbacks, avoiding wetland impacts, limitations on planting within and adjacent to transmission line corridors, and visibility requirements for security around the proposed Substation.

### **iii. Buffering for Visual Impacts (Specific to LUPC Review)**

The Project crosses three areas designated by LUPC as P-RR (Recreation Protection Subdistrict), which allows utility facilities as a special exception. These are Beattie Pond, the Appalachian National Scenic Trail crossing near Joe's Hole in Moxie Pond, and the Kennebec River Crossing in Moxie Gore/West Forks.

The special exception criteria for utility facilities in the P-RR subdistrict require the applicant to show that the use can be buffered from those other uses or resources within the subdistrict with which it is incompatible.

**Beattie Pond**, partially located in Beattie Twp and Lowelltown Twp, is classified as a

remote pond (Management Class VI), surrounded by a half-mile P-RR subdistrict. The Maine Wildlands Lake Assessment designated Beattie Pond as Resource Class 2: a lake of regional significance, primarily for its fisheries resource. Scenic resources were not considered unique or significant.

In the September 2017 application submission, one of the Project's angle structures appeared prominently visible above the horizon when seen from the northern portion of the pond. By re-engineering this structure, the height has been reduced by approximately 39 feet, allowing the majority of the structure to be buffered by existing vegetation. The top of the weathering steel structure will still be minimally visible above the tree line from a few areas on the pond but will not appear above the horizon.

In a similar manner the height of other structures was reduced, so none will be seen against the sky. The self-weathering steel will minimize contrasts with the surrounding wooded hillside. The redesigned structures will be considerably less prominent, if noticeable at all, to recreational users on the pond.

At the **Upper Kennebec River** the P-RR subdistrict extends 250' from the normal high-water mark on each side of the river. The original project design called for an overhead transmission line to cross the river, placing transmission structures outside the 250'-wide P-RR subdistrict and maintaining forested buffers to minimize visual impacts on the river. The amended plan uses HDD technology to drill under the river, thus avoiding any visual impact to the resource and expanding the forested buffers on both sides of the river to 1,450 feet and 1,160 feet. This approach means there will be no views of transmission structures, overhead conductors, warning balls, or termination stations from the P-RR subdistrict.

The **Appalachian Trail** is located within a 200'-wide P-RR subdistrict in three locations on the southwest side of Moxie Pond in Bald Mountain Twp. The crossings all occur in an existing CMP corridor that contains a 115kV transmission line. The second crossing, where the trail is co-located with Troutdale Road, is partially in the P-RR subdistrict and partially in a D-RS subdistrict. The location of the trail throughout this 3,500' section of existing transmission corridor prevented CMP from avoiding impacts within the subdistrict. Five transmission structures will be installed in this area; one will be located within the P-RR subdistrict as a result of the trail alignment. Co-locating the Project within the existing transmission corridor minimizes visual impacts to hikers and other users in this P-RR subdistrict. In addition, CMP reduced structure heights throughout the west side of Moxie Pond to minimize potential visual impacts to the trail from the summits of Pleasant Pond Mountain and Bald Mountain.

Based upon our photosimulations, we concluded that the views of the expanded transmission corridor from a 400-foot section of the AT where it is co-located with Troutdale Road justified mitigation. A planting plan using native plantings to buffer views of the expanded transmission corridor has been proposed by CMP.

#### **iv. Issue 1 Conclusion (Relevant to DEP and LUPC Review)**

In my opinion, for the foregoing reasons, the development will not adversely affect scenic character. The design of the Project takes into account the scenic character of the surrounding area, and it will be located, designed and landscaped to minimize its visual impact to the fullest extent possible. Structures have been designed and landscaped to minimize their visual impact on the surrounding area, and the plans for the proposed development provide for the preservation of existing elements of the development site which contribute to the

maintenance of scenic character. So too has the Project been adequately buffered to screen the Project from adjacent uses.

The Project will not unreasonably interfere with existing scenic, aesthetic, recreational, or navigational uses, as demonstrated by the Visual Impact Assessment. CMP has incorporated environmentally sensitive design principles and components, including planning and siting the Project to mitigate potential visual impacts and designing the Project in such a way that reduces or eliminates visual impacts to the area in which is located, as viewed from a scenic resource.

Finally, CMP has made adequate provision for buffer strips, and the Project can be buffered from other uses and resources within the P-RR subdistrict.

**b. Issue 3 (Alternatives Analysis) (Relevant to DEP and LUPC Review)**

As discussed above, CMP's evaluation of route options resulted in a siting of the Project that minimized its potential visual and other environmental impacts on scenic and other natural resources. CMP's rigorous approach to siting, which included consideration of practicable alternatives, culminated in a Project design that does not unreasonably interfere with existing scenic and aesthetic uses. There is no practicable alternative to the Project as designed that will have less visual impact.

This is best exemplified by the efforts CMP made in siting the Project with regard to the five locations it will cross that have been designated as outstanding river segments:

- Upper Kennebec River
- Kennebec River below Wyman Dam
- Carrabassett River
- Sandy River
- West Branch of the Sheepscot River

CMP proposes to use HDD to go under the Upper Kennebec River to avoid visual impacts to that Outstanding River Segment. This measure will fully preserve the aesthetic character of this section of the Kennebec River by eliminating views of an overhead transmission line and warning balls that would have been visible to recreational users of the river. The HDD work has been designed so none of the activities associated with the drilling (i.e., the Moxie Gore and West Forks Termination Stations) will be visible from the river.

The other four outstanding river segments are the Kennebec River below Wyman Dam, Carrabassett River, Sandy River, and the West Branch of the Sheepscot River. The Lower Kennebec River, like the Upper Kennebec River, is noted for its scenic value in the Maine Rivers Study. The Project will cross the Kennebec immediately below the Wyman Dam, in a location that is visually dominated by the dam, electrical substation, access roads, and existing transmission lines. The Carrabasset River, Sandy River, and the West Branch of the Sheepscot River, on the other hand, are not noted for their scenic value in the Maine Rivers Study.

In all four of these river segments CMP has minimized visual impacts by co-locating the HVDC line within an existing transmission corridor. By using the existing rights-of-way, additional clearing will be limited to a typical width of 75' and impacts will be concentrated in locations where transmission lines already cross the rivers.

Further, in response to environmental review comments from MDIFW, CMP will retain 100-foot riparian buffers at all outstanding river segments, which will minimize views of the corridor for anglers, duck hunters, boaters, and other recreational users. Given the minimal visual impact on these outstanding river segments, CMP has demonstrated that no reasonable alternative exists which would have less adverse effect upon the natural and recreational features of the outstanding river segments it crosses. There are no practicable alternatives to the Project that



will have less visual impact, nor is there an alternative site to the locations within the P-RR subdistrict that are both suitable to the proposed use and reasonably available to CMP.

**V. Conclusion (Relevant to DEP and LUPC Review)**

It is my opinion that the Project will not unreasonably interfere with existing scenic and aesthetic uses, and does not diminish the public enjoyment and appreciation of the qualities of the scenic resources, and any potential impacts have been minimized. The activity will not have an unreasonable impact on the visual quality of protected natural resources as viewed from a scenic resource. The development will not adversely affect scenic character. There is no practicable alternative to the proposed activity that will have less visual impact, and no reasonable alternative to the outstanding river segment crossings that would have less adverse effect upon the natural and recreational features of these river segments. With respect to portions of the Project located in LUPC's P-RR subdistricts, the Project will be buffered from those uses within the vicinity or area likely to be affected by the proposal with which it is or may be incompatible, and there is no alternative site which is both suitable to the proposed use and reasonably available to CMP.

Exhibits:


CMP-5-A: Segal CV

CMP-5-B: Summary Presentation

CMP-5-C: Compilation of Methodology and Findings

Dated: Feb. 26, 2019

Respectfully submitted,

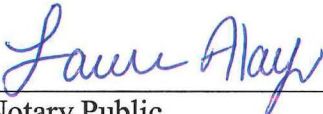
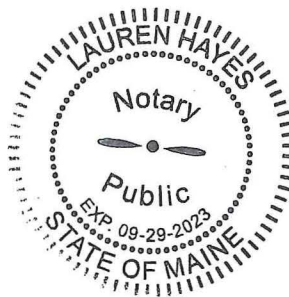
  
Amy Bell Segal

STATE OF MAINE

York, ss.

The above-named Amy Bell Segal did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Before,

Dated: 2.26.19  
Notary Public  
Name: Lauren Hayes  
My Commission Expires:





## AMY BELL SEGAL RLA, ASLA

SENIOR ASSOCIATE | LANDSCAPE ARCHITECT

Amy's twenty six years of experience includes scenic resources and visual resource assessments, downtown master planning, urban design, recreation and trail planning, playspace design, urban agriculture, site planning for residential, commercial, and industrial properties, shoreland zoning permitting and construction management.

### SELECTED PROJECT EXPERIENCE

**NEW ENGLAND CLEAN ENERGY CONNECT** Visual Impact Assessment of 145 miles of new HVDC Transmission line and associated upgrades, 16 miles of Rebuilt 115 kV transmission line, and 26 miles of co-located 345 kV transmission line proposed to deliver electric generation from the Canadian Border through Maine to the New England Control Area for Central Maine Power / Avangrid, Sub-consultant to Burns & McDonnell.

**ROXWIND, ROXWIND LLC, Roxbury, ME.** Visual Impact Assessment for a four turbine wind project south of Record Hill.

**NUMBER NINE WIND FARM, EDP RENEWABLES, Aroostook County, ME.** Visual Impact Assessment for 129 turbine wind farm and 50 mile generator lead line.

**BULL HILL AND HANCOCK WIND PROJECTS, Blue Sky East LLC, Hancock County, ME.** Visual Impact Assessment for adjacent wind projects with total of 37 turbines.

**SPRUCE MOUNTAIN WIND PROJECT, PATRIOT RENEWABLES, Woodstock, ME.** Prepared Visual Impact Assessment for proposed 11 turbine wind project.

**SADDLEBACK MOUNTAIN WIND PROJECT, PATRIOT RENEWABLES, Carthage, ME.** Visual Impact Assessment for 12 turbine wind project.

**MAINE POWER RELIABILITY PROGRAM.** Visual Impact Assessment for 352 miles of new 115 kV and 345 kV transmission line corridor system upgrades in 82 Maine towns, for Central Maine Power.

**LEMPSTER MOUNTAIN WIND POWER PROJECT, COMMUNITY ENERGY, Lempster, NH.** Photosimulations for a 12 turbine wind project.

**STETSON I & II WIND PROJECT, EVERGREEN WIND V, LLC, Washington County, ME.** Visual Impact Assessment including 3D Modeling and photosimulations for a 38 turbine wind project.

**JAMER MATERIALS, LTD. BAYSIDE, New Brunswick, Canada.** Visual Assessment for proposed quarry expansion and conceptual design of Eco-Industrial Park.

**RECORD HILL WIND PROJECT, Roxbury, ME.** Visual Impact Assessment for a 22 turbine wind project submitted to MEDEP.

**DOWNEAST LNG, Robbinston, ME.** Visual Impact Assessment for LNG terminal submitted to Maine DEP for Downeast LNG, Inc.

**METHUEN COMPRESSOR STATION, DUKE ENERGY, Methuen, MA.** Created 3D Model and photosimulations to illustrate visibility of proposed project and possible buffering options.

### PROFESSIONAL LICENSURE

Maine Licensed Landscape Architect #2265

CLARB Certified

### EDUCATION

BSLA Cornell University  
Denmark International Study Program

### SPECIAL TRAINING

- MaineDOT LAP Certified
- MeDEP Low Impact Development Stormwater BMP training
- Courses in ADA standards, Complete Streets, Sustainable Sites (ASLA LEED equiv)
- National Park Service Scenic Inventory Methodology workshop, ATC Conference, Colby College, 2017

### PROFESSIONAL EMPLOYMENT

1992 - present Terrence J Dewan & Associates  
Landscape Architects & Planners  
Yarmouth, ME

1990 Summer Roger Trancik, FASLA,  
Ithaca, NY

1988 - 1992 Bell & Spina Architects  
Camillus, NY

### PROFESSIONAL ORGANIZATIONS

Parks Commission, City of Portland

Chairperson/Treasurer for the Maine Section of the American Society of Landscape Architects, 2002 - present

Consultant to Portland Trails Land Trust for the Schoolyard Greening Initiative, 1999 - present.



## AWARDS AND DISTINCTIONS

American Society of Landscape Architects  
Merit Award for Communications  
Los Angeles River Study.

American Society of Landscape Architects  
Merit Award for Communications  
Chattahoochee River Greenway, Atlanta, GA.

National Association for Interpretation  
Interpretive Media Award  
Great Bay National Estuarine Research Reserve,  
Sandy Point, NH.

## PRESENTATIONS

Co-Presenter, Using Photoshop as a Design Tool,  
ASLA, Portland, OR 1998

Co-presenter at LABASH, Creating Visualizations  
with Computers, University of West Virginia, 1998

Co-Presenter, Creating Visualizations with

Computers, AEC Conference, Philadelphia, 1997

**BLACK NUBBLE WIND PROJECT, Redington Township, ME.** Visual Impact Assessment and photosimulations of proposed 18 wind turbines as seen from various viewpoints, including the Appalachian Trail, for Maine Mountain Power.

**RICHMOND COMPRESSOR STATION, MARITIMES AND NORTHEAST PIPELINE, Richmond, ME.** Photosimulations and buffer plan for the Pitts Center Road compressor station.

**BYPASS VISUALIZATIONS, Wiscasset, ME.** MEDOT. Photosimulations of proposed Route One bypass options. Images used for evaluation of options, public meetings, and website.

**BATH IRON WORKS, NAVAL SECURITY PLANNING, Bath, ME.** New security access, fencing and parking lot improvements.

**BATH IRON WORKS, LAND LEVEL TRANSFER FACILITY, Bath, ME.** Visual Impact Assessment and photosimulations for BIW's new shipbuilding facility on the Kennebec River.

**WASHINGTON STREET PLANTINGS, Bath, ME.** Bath Iron Works was required for LLTF permitting with City and State to develop site specific buffer and enhancement plan for Washington Street.

**DRAGON PRODUCTS, Thomaston, ME.** A landscape enhancement plan for a one-mile stretch of coastal Route One adjacent to a large open pit mine.

**SADDLEBACK MOUNTAIN, Rangeley, ME.** National Park Service. Photosimulations of ski area expansion plans to show potential impact on Appalachian Trail.

**NEW ENGLAND WIND ENERGY STATION, Boundary Mountains, ME.** Kennetech Windpower, Livermore, CA. Visual Impact Assessment and photosimulations for an industrial scale wind energy facility planned for 250,000 acres in western Maine.

**SAWYER ENVIRONMENTAL LANDFILL, Hampden, ME.** Photosimulations of landscape treatment and landform adjustments for the expansion of a highly visible landfill adjacent to the Maine Turnpike.

**LIQUEFIED NATURAL GAS FACILITY, Wells, ME.** Visual impact assessment and photosimulations of a proposed LNG tank in rural Wells.

**VISUAL RESOURCE ASSESSMENT, RT. 27 Carrabassett Valley, ME, MEDOT.** Visual resource assessment and improvements to one of Maine's Scenic Byways.

**HALLOWELL INTERPRETIVE TURNOUT, MEDOT.** Lead design team in production of construction documents for the first turnout to be installed along the Kennebec Chaudière Corridor. Site includes interpretive panels, railing, seating and paving, and landscaping.

**KANCAMAGUS SCENIC BYWAY, WHITE MOUNTAIN NATIONAL FOREST, Conway to Lincoln, NH.** Preliminary Facilities and Interpretive Media Plan. Redesigning Cleveland Digitally, Cleveland, OH. Site planning and computer illustrations for a former mill site in Cleveland. Presented at the 1995 Annual Meeting of ASLA.

**LOS ANGELES RIVER STUDY, Los Angeles, CA.** A study of aesthetic treatments for the 50-mile concrete channel lining the Los Angeles River. Illustrations of murals, parks, walkways, and gardens. Presented at the Computer Design Charrette at the 1996 ASLA Annual Meeting.





Central Maine Power Company

# New England Clean Energy Connect

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April 1 - 5, 2019

Visual Impact Assessment

Amy Bell Segal

Terrence J. DeWan



# INTRODUCTION

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## AMY BELL SEGAL

Project tasks included research, inventory, leading fieldwork, agency review meetings and site walks, overseeing production of modeling and photosimulations, coordination with environmental and engineering team, and authoring the VIA report and supplemental submissions

## TERRENCE J. DEWAN

Project oversight post submittal, and authoring of supplemental submissions

# INTRODUCTION

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**TJD&A** is one of three firms, and the only one in Maine, who are pre-qualified to perform peer reviews of visual assessments for the Maine Department of Environmental Protection.

Over the past four decades the firm has prepared close to 100 Visual Impact Assessments (VIAs) for a wide variety of projects throughout New England.



## TESTIMONY PURPOSE

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This testimony provides our assessment of the potential effect that the New England Clean Energy Connect may have on:

- a) **Scenic Resources**
- b) **Scenic and Aesthetic Uses**

### **Conclusion:**

The Project will not unreasonably interfere with existing scenic and aesthetic uses, and does not diminish the public enjoyment and appreciation of the qualities of the scenic resources, and any potential impacts have been minimized. The activity will not have an unreasonable impact on the visual quality of protected natural resources as viewed from a scenic resource.

## CHAPTER 315 and 375.14

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The **NRPA and Chapter 315** require an applicant to demonstrate that a proposed activity will not unreasonably interfere with existing scenic and aesthetic uses of a scenic resource. Applies to activities in, on, over, or adjacent to a protected natural resource. Avoid unreasonable, adverse, visual impacts to existing scenic and aesthetic uses.

More broadly, the **Site Law and Chapter 375.14** require an applicant to demonstrate that the development will not have an unreasonable adverse effect on the scenic character of the surrounding area. Potential impacts to identified scenic resources, and other points of local sensitivity, have been assessed within each segment.

# OUTSTANDING RIVER SEGMENTS

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The NECEC crosses the following five locations which are afforded special protection as outstanding river segments, as identified in 38 M.R.S. 480-P and Title 12: M.R.S. § 403: Special Protection for outstanding rivers:

- Upper Kennebec River (underground)
- Kennebec River below Wyman Dam, Moscow
- Carrabassett River, Anson
- Sandy River, Farmington
- West Branch of the Sheepscot River, Windsor

**The applicant shall demonstrate that no reasonable alternative exists which would have less adverse effect upon the natural and recreational features of the river segment 38 M.R.S. § 480- D (8).**

## LUPC RECREATION PROTECTION SUBDISTRICT (P-RR)

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Utility facilities may be allowed within P-RR subdistricts as special exceptions upon issuance of a permit from the Commission pursuant to 12 M.R.S.A. § 685-A(10), and subject to the applicable requirements set forth in Sub-Chapter III, provided that the applicant shows by substantial evidence that

**(a) there is no alternative site which is both suitable to the proposed use and reasonably available to the applicant;**

**(b) the use can be buffered from those other uses and resources within the subdistrict with which it is incompatible; and**

**(c) such other conditions are met that the Commission may reasonably impose in accordance with the policies of the Comprehensive Land Use Plan**

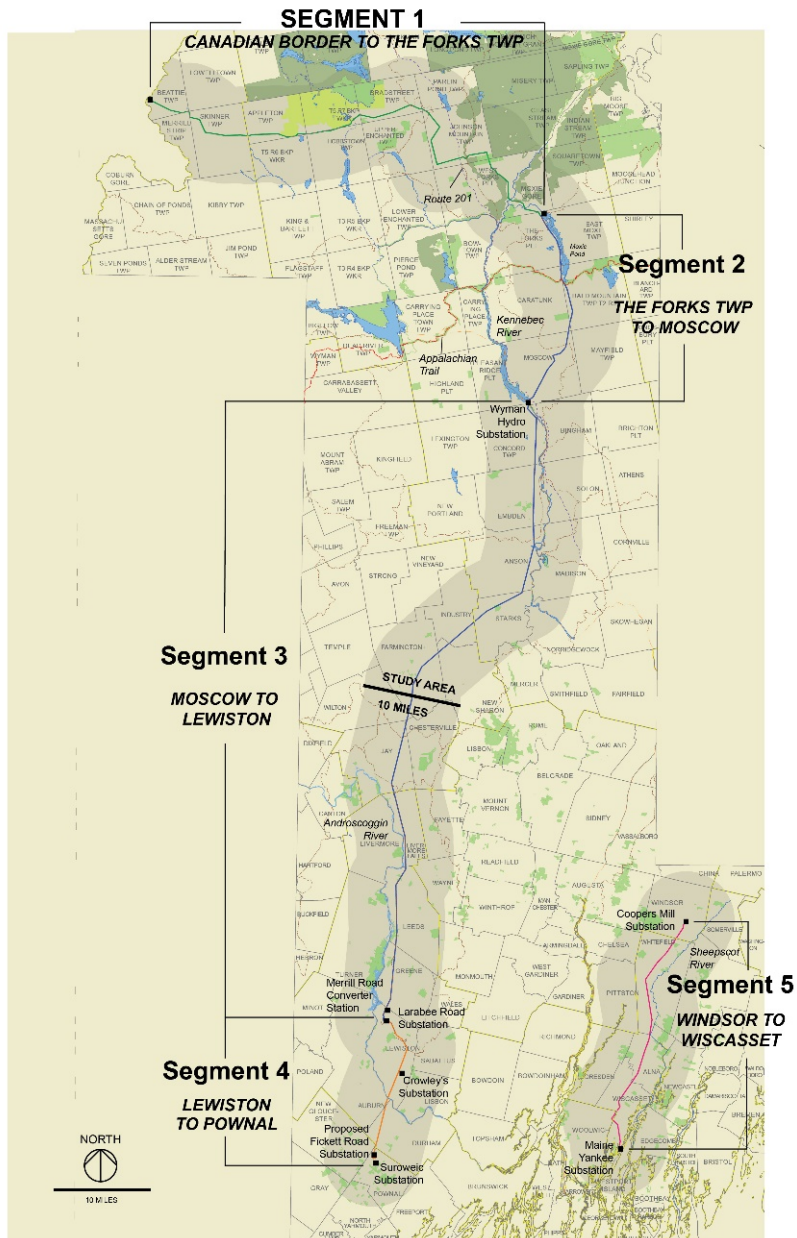
# Overview of Visual Impact Assessment

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- Develop Project Understanding
- Determine Study Area (APE)
- Research, Inventory and Identify Scenic Resources
- Prepare Viewshed Analysis
- Perform Fieldwork and Photographic Documentation
- Assess Project Visibility with Computer Analysis Techniques
- Prepare Photosimulations
- Determine Visual Impact
- Develop Mitigation Recommendations



# Determine Study Area (Area of Potential Affect)



**Segment 1:** Quebec border to north end of Moxie Pond in The Forks - 53.5 miles of HVDC transmission line within a new 150' wide cleared corridor within a 300' right-of-way. Single pole self-weathering steel structures with an average height of 100'.

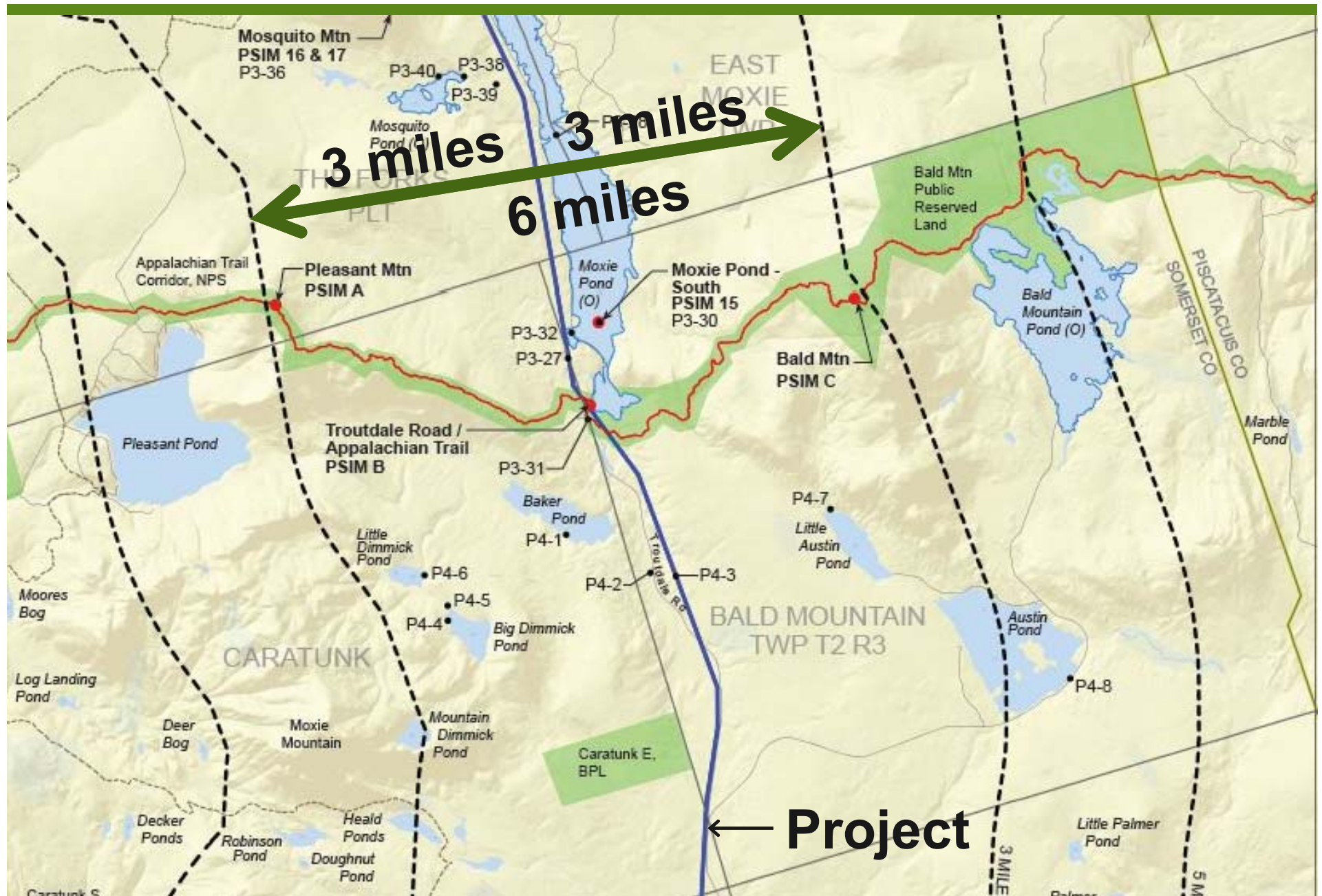
**Segment 2:** Northern end of Moxie Pond to Wyman Hydro in Moscow - 22± miles of a HVDC transmission line. Co-located within an existing 115kV transmission corridor. Existing 150' wide corridor clearing increased by 75' on the western side. Single pole self-weathering steel structures with an average height of 100'.

**Segment 3:** Wyman Hydro in Moscow to Larrabee Road Substation in Lewiston - 70 miles+/- . Co-located within an existing 115kV transmission corridor. Existing 150' wide corridor clearing increased by 75' on the western side.

**Segment 4:** Larrabee Road Substation in Lewiston to the proposed Fickett Road Substation in Pownal - 16 miles. Rebuild of Sections 62 and 64.

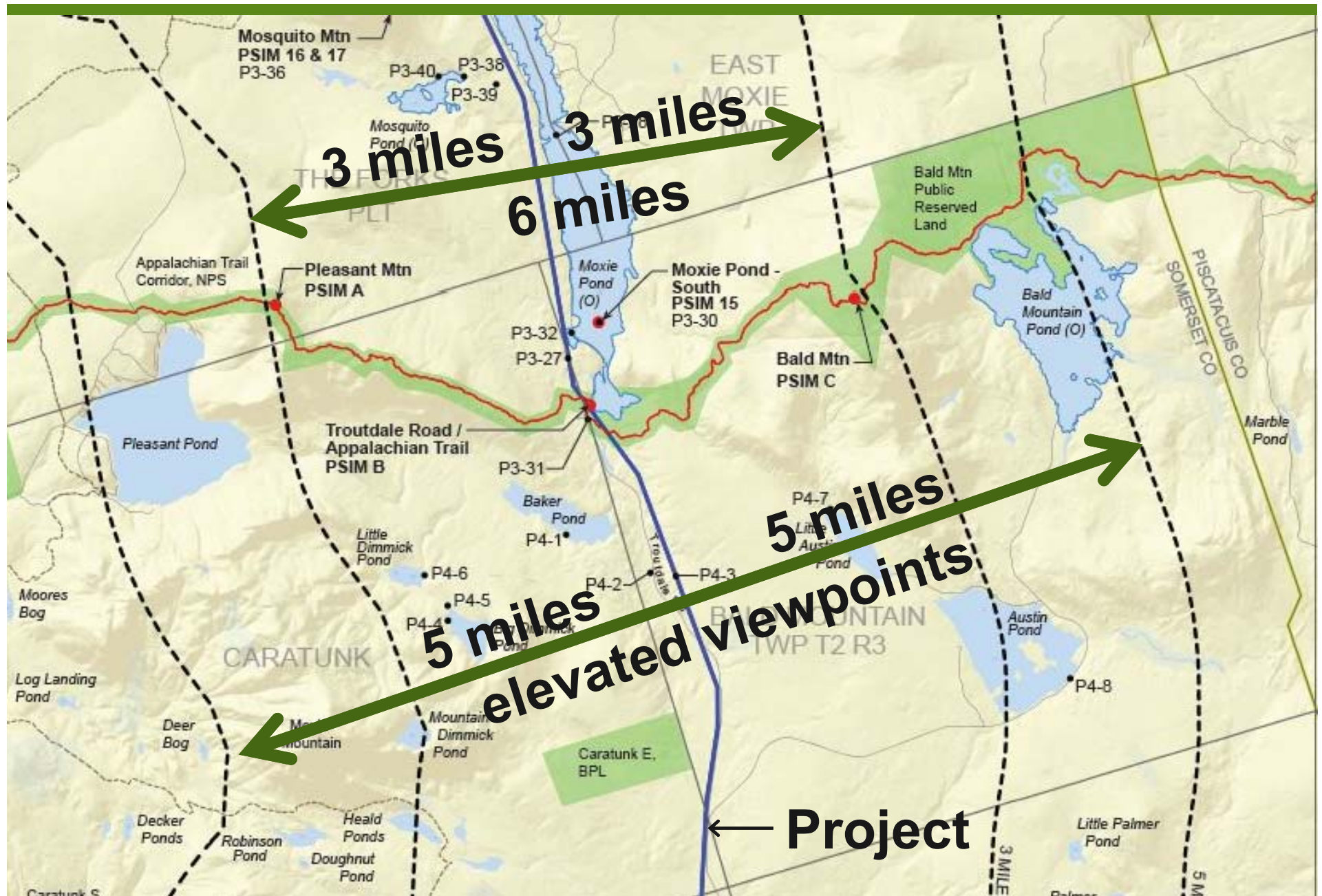
**Segment 5:** Coopers Mill Substation in Windsor to Maine Yankee Substation in Wiscasset - 26.5 miles. Co-located 345kV transmission line.

## Determine Study Area (Area of Potential Affect)





# Determine Study Area (Area of Potential Affect)





## Viewing Distance – Foreground – within 0.5 mile





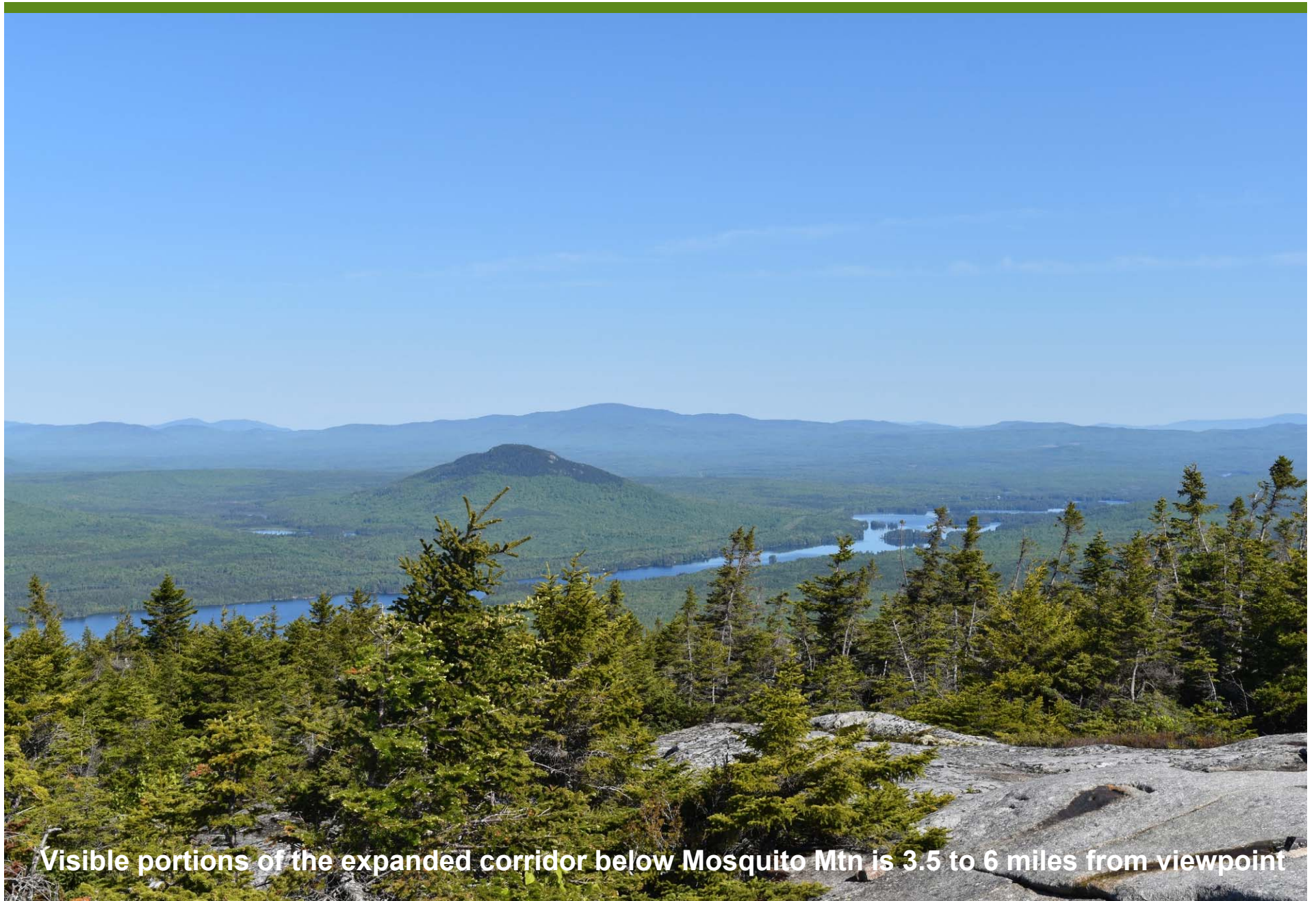
## Viewing Distance – Midground – 0.5 to 3 miles<sup>5063</sup>



Structure on shoulder of Coburn Mountain is 2 miles from viewpoint



## Viewing Distance – Background <sup>5064</sup>beyond 3 miles



## Research, Inventory, and Identify Scenic Resources

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- World Street Maps, USGS maps
- 3D PLS CADD models, cross-sections, and elevations, substation grading plans provided by POWER Engineers...etc.
- Maine Office of GIS data files
- Maps and other documentation from municipal plans
- Land for Maine's Future Board
- Maine Department of Agriculture, Conservation and Forestry (MDACF) information on State Parks, Wildlife Refuges, and other state lands
- Maine Department of Inland Fisheries & Wildlife (MDIFW) Lake Survey Maps
- Interconnected Trail Systems (ITS) mapping
- Maine Land Use Planning Commission
- National Park Service, National Natural Landmark program
- The Nature Conservancy
- Trust for Public Land
- The Forest Society of Maine
- Local/regional land trusts
- National Register of Historic Places; Maine Historic Preservation Commission
- Maine Lakes Study; Maine Wildlands Lake Assessment; Maine Rivers Study
- DeLorme Atlas and Gazetteer; Google Earth; Maine Trail Finder; and other secondary data sources



## Summary of Scenic Resources, Chapter 315

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- A. National Natural Landmark or other outstanding natural and cultural features**
- B. State or National Wildlife Refuges, Sanctuaries, or Preserves or State Game Refuges**
- C. State or Federal Designated Trail**
- D. A property on or eligible for inclusion in the National Register of Historic Places**
- E. National or State Parks**
- F1. Municipal Park or Public Open Space**
- F2. Publicly owned land visited, in part, for the use, observation, enjoyment, and appreciation of natural or man-made visual qualities**
- F3. Public Resource, such as the Atlantic Ocean, a great pond, or a navigable river**

## Summary of Scenic Resources, Chapter 315

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### A. National Natural Landmark or Other Outstanding Natural and Cultural Features

- **No. 5 Bog and Jack Pine Stand** – Minimal to negligible Project visibility, beyond 3 miles

## Summary of Scenic Resources, Chapter 315

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### B. State or National Wildlife Refuges, Sanctuaries, or Preserves or State Game Refuges

- **Holeb PRL/Attean Pond/Moose River** – No Project visibility within 3 miles
- **Number 5 Bog Ecological Preserve** - Project visibility Minimal/negligible
- **Fahi Pond WMA** – Minimal Project views, top of one structure
- **Chesterville WMA** –No Project views
- **Thurston WMA** – No Project views
- **Tolla Wolla WMA** – No Project views
- **Alonzo H. Garcelon WMA** – No Project views
- **Earle R. Kelly WMA** – No Project views

## Summary of Scenic Resources, Chapter 315

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### C. State or Federal Designated Trail

- **Appalachian National Scenic Trail** – Foreground Project visibility adjacent to three existing transmission line crossings. Background views from Pleasant Pond Mountain and Bald Mountain
- **ITS Routes 89, 87, 86, 84, 82, 115** – Project visibility at crossings and from trails within existing transmission line corridors
- **Androscoggin Riverlands State Park (Trails)** – Project visibility from motorized trail crossing / access road within existing transmission line corridor
- **Kennebec Valley Trail/ITS 84** – Project visibility at co-located transmission line crossing in North Anson

## Summary of Scenic Resources, Chapter 315

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### D. A property on or eligible for inclusion in the National Register of Historic Places

- There are 66 sites or structures **Listed** on NRHP within 3 miles.  
The only resource with Project views is the **Arnold Trail** at the crossing of the Lower Kennebec River below Wyman Hydro and from the southern portion of Wyman Lake
- There are 4 Properties **Eligible** for Listing with potential Project views:  
Bingham Union in Bingham, Valley Cemetery in Greene, Maine Central Railroad, and Garfield School in Concord Twp
- There are 3 Publically owned **Cemeteries** with potential Project views:  
Village Cemetery in Bingham, Athearn Cemetery in Anson, and Bradbury Cemetery in Durham.

## Summary of Scenic Resources, Chapter 315

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### E. National or State Parks

- **Appalachian National Scenic Trail** – Project visibility at three crossings and from Pleasant Pond Mountain and Bald Mountain summits
- **Androscoggin Riverlands State Park** – Project visibility within existing transmission line corridor on East side of Androscoggin River
- There will be **NO** Project views from Bradbury Mountain State Park

# Summary of Scenic Resources, Chapter 315

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## F1. Municipal Parks and Public Open Space

- **Pleasant Ridge Swim Area/Wyman Lake Recreation Lake** (Pleasant Ridge Plt) – Project views adjacent to Wyman Dam
- **Carrabec High School** (Anson) – Project visibility adjacent to co-located transmission line
- **Monument Hill** (Leeds) – Background view of Larrabee Road Substation
- Minor visibility in leaf off conditions from Runaround Pond Recreation Area



## Summary of Scenic Resources, Chapter 315

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### F2. Publicly owned land visited, in part, for the use, observation, enjoyment, and appreciation of natural or man-made visual qualities

- **Coburn Mountain, (Bureau of Parks & Lands Parcel parcel in Upper Enchanted Twp)** – Midground Project view occupies 24 degrees or 9% of 360 degree view from the summit
- **Cold Stream Forest Parcel** - Project visibility from crossing adjacent to Capital Road in Johnson Mountain Twp
- **Route 201 Old Canada Road National Scenic Byway** – Project visibility in Attean Rest Area (7+ miles), Parlin Pond Twp, crossing at Johnson Mountain Twp, crossing in Moscow, and Bingham. 49 miles within Study Area

## Summary of Scenic Resources, Chapter 315

### F3. Public Resource, such as the Atlantic Ocean, a great pond, or a navigable river

| SEGMENT 1<br>RESOURCE TYPE                                                   | Total<br>Number | Total No. With<br>Project Views | Resource with Project Visibility                                                                                                                                             |
|------------------------------------------------------------------------------|-----------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Great Pond Rated for<br>Scenic Resources                                     | 6               | 3                               | <b>Rock Pond</b> (T5 R6 BKP WKR) 'Significant' rating<br><b>Fish Pond</b> (Hobbs town Twp) 'Significant' rating<br><b>Parlin Pond</b> (Parlin Pond Twp) 'Significant' rating |
| Remote Pond                                                                  | 6               | 2                               | <b>Beattie Pond</b> (Beattie Twp)<br><b>Wing Pond</b> (Lowelltown Twp/Skinner)                                                                                               |
| Great Pond<br>(Non-rated)                                                    | 23              | 3                               | <b>Little Wilson Hill Pond</b> (Johnson Mtn Twp), <b>Iron Pond</b> (T5 R6 BKP WKR)<br><b>Egg Pond</b> (Bradstreet Twp),                                                      |
| River/Stream rated for<br>Scenic Resources /<br>Outstanding River<br>Segment | 2               | 2                               | <b>Cold Stream</b> (Johnson Mtn Twp),<br><b>Moxie Stream</b> (Moxie Gore),                                                                                                   |
| Other Rivers,<br>Brooks, Streams                                             | 1+              | 1+                              | <b>So. Branch Moose River</b> (Lowelltown Twp/<br>Skinner Twp), Gold Brook, Mountain Brook                                                                                   |

## Summary of Scenic Resources, Chapter 315

### F3. Public Resource, such as the Atlantic Ocean, a great pond, or a navigable river

| SEGMENT 2<br>RESOURCE TYPE                                                   | Total<br>Number | Total No. With<br>Project Views | Resource with Project Visibility                                                                                                                 |
|------------------------------------------------------------------------------|-----------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|
| Great Pond Rated for<br>Scenic Resources                                     | 3               | 2                               | <b>Moxie Pond</b> (East Moxie Twp, The Forks Plt, Bald Mountain Twp) - 'Outstanding' rating<br><b>Wyman Lake</b> (Moscow) - 'Significant' rating |
| Remote Pond                                                                  | 0               | 0                               | -                                                                                                                                                |
| Great Pond<br>(Non-rated)                                                    | 13              | 1                               | <b>Temple Pond</b> (Moscow)                                                                                                                      |
| River/Stream rated for<br>Scenic Resources /<br>Outstanding River<br>Segment | 0               | 0                               | -                                                                                                                                                |
| Other Rivers,<br>Brooks, Streams                                             | 1+              | 1+                              | <b>Baker Stream</b> (Bald Mountain Twp T2 R3), and<br>other small stream crossings                                                               |

## Summary of Scenic Resources, Chapter 315

### F3. Public Resource, such as the Atlantic Ocean, a great pond, or a navigable river

| SEGMENT 3<br>RESOURCE TYPE                                                   | Total<br>Number | Total No. With<br>Project Views | Resource with Project Visibility                                                                                                                                                      |
|------------------------------------------------------------------------------|-----------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Great Pond Rated for<br>Scenic Resources                                     | 1               | 0                               | -                                                                                                                                                                                     |
| Great Pond<br>(Non-rated) with<br>visibility                                 | 31              | 4                               | <b>Fahi Pond</b> (Embden), <b>Allen Pond</b> (Greene), <b>Berry Pond</b> (Greene), <b>Clearwater Pond</b> (Industry),                                                                 |
| Great Pond<br>(Non-rated)<br>Negligible Visibility                           |                 | 6                               | <b>Androscoggin Lake</b> (Leeds), <b>Cold Pond</b> (Starks), <b>Pease Pond</b> (Wilton), <b>Locke Pond</b> (Chesterville), <b>North Pond</b> (Chesterville), <b>Parker Pond</b> (Jay) |
| River/Stream rated for<br>Scenic Resources /<br>Outstanding River<br>Segment | 3               | 3                               | <b>Lower Kennebec River</b> (Moscow), <b>Carrabassett River</b> (North Anson)<br><b>Sandy River</b> (Farmington)                                                                      |
| Other Rivers,<br>Brooks, Streams                                             | 2+              | 2+                              | <b>Dead River</b> (Leeds), <b>Stetson Brook</b> (Greene), and other small stream crossings                                                                                            |

## Summary of Scenic Resources, Chapter 315

### F3. Public Resource, such as the Atlantic Ocean, a great pond, or a navigable river

| SEGMENT 4<br>RESOURCE TYPE                                                   | Total<br>Number | Total No. With<br>Project Views | Resource with Project Visibility                                                                                                                          |
|------------------------------------------------------------------------------|-----------------|---------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------|
| Great Pond Rated for<br>Scenic Resources                                     | 0               | 0                               | -                                                                                                                                                         |
| Great Pond<br>(Non-rated) with<br>visibility                                 | 3               | 2                               | <b>Runaround Pond</b> (Durham) – leaf off<br><b>No Name Pond</b> (Lewiston)                                                                               |
| River/Stream rated for<br>Scenic Resources /<br>Outstanding River<br>Segment | 0               | 0                               | -                                                                                                                                                         |
| Other Rivers,<br>Brooks, Streams                                             | 3+              | 3+                              | <b>Androscoggin River</b> (Auburn),<br><b>Runaround Brook</b> (Durham) at ex. crossing<br><b>Libby River</b> (Auburn)<br>and other small stream crossings |

## Summary of Scenic Resources, Chapter 315

### F3. Public Resource, such as the Atlantic Ocean, a great pond, or a navigable river

| SEGMENT 5<br>RESOURCE TYPE                                                   | Total<br>Number | Total No. With<br>Project Views | Resource with Project Visibility                |
|------------------------------------------------------------------------------|-----------------|---------------------------------|-------------------------------------------------|
| Great Pond Rated for<br>Scenic Resources                                     | 0               | 0                               | -                                               |
| Great Pond<br>(Non-rated) with<br>visibility                                 | 12              | 0                               | -                                               |
| River/Stream rated for<br>Scenic Resources /<br>Outstanding River<br>Segment | 2               | 1                               | West Branch of the Sheepscot River<br>(Windsor) |
| Rivers, Brooks,<br>Streams                                                   | 1+              | 1+                              | Montsweag Brook (Wiscasset, Woolwich)           |

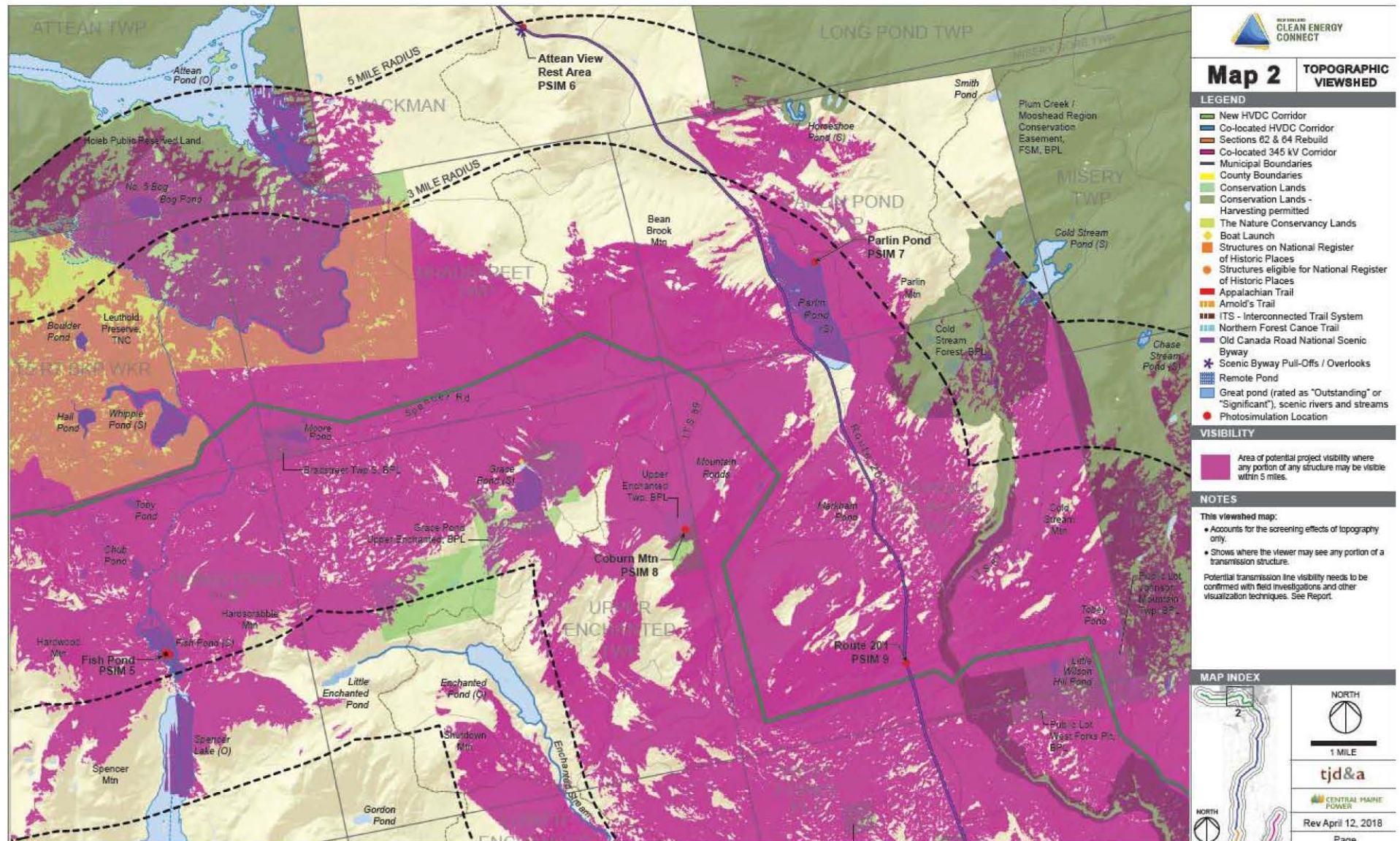
# Scenic Resource Summary Chart - Excerpt

Attachment F – Scenic Resource Chart  
January 30, 2019

| Scenic Resource                                                                                                              | Town                                                             | County                             | Type       | Topo<br>Visibility | Forest<br>Visibility | TJDA Field<br>Visit | TJDA<br>Computer<br>Analysis | Project Visibility Determination                                                                                                                                                                                      | Visual Impact                                                                                                                                                                                               |
|------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|------------------------------------|------------|--------------------|----------------------|---------------------|------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Table 1. National Natural Landmarks and other Outstanding Natural and Cultural Features within 3 Miles of NECEC</b>       |                                                                  |                                    |            |                    |                      |                     |                              |                                                                                                                                                                                                                       |                                                                                                                                                                                                             |
| Moose River-Number 5 Bog                                                                                                     | Bradstreet Twp.,<br>T5 R7 BKP WKR                                | Somerset                           | NNL        | Y                  | Y                    | Y                   | N                            | Viewshed map indicates potential but fieldwork confirmed intervening evergreen vegetation will screen within 3 miles of the Project                                                                                   | No Impact                                                                                                                                                                                                   |
| Number 5 Bog CE                                                                                                              | T5 R7 BKP WKR                                                    | Somerset                           | NNL        | Y                  | N                    | Y                   | N                            | Minimal/ Negligible, limited access                                                                                                                                                                                   | Negligible Impact                                                                                                                                                                                           |
| <b>Table 2. State or National Wildlife Refuges, Sanctuaries, or Preserves and State Game Refuges within 3 Miles of NECEC</b> |                                                                  |                                    |            |                    |                      |                     |                              |                                                                                                                                                                                                                       |                                                                                                                                                                                                             |
| Chesterville WMA                                                                                                             | Jay                                                              | Chesterville                       | WMA        | Y                  | N                    | Y                   | Y                            | No visibility due to intervening terrain/vegetation                                                                                                                                                                   | No Impact                                                                                                                                                                                                   |
| Chesterville WMA                                                                                                             | Jay, Chesterville                                                | Chesterville                       | WMA        | Y                  | Y                    | Y                   | Y                            | No visibility due to intervening terrain/vegetation                                                                                                                                                                   | No Impact                                                                                                                                                                                                   |
| Fahi Pond WMA                                                                                                                | Embden                                                           | Somerset                           | WMA        | Y                  | Y                    | Y                   | Y                            | Minimal/ Negligible, tip of one structure potential                                                                                                                                                                   | Negligible Impact. See overlays included with submission                                                                                                                                                    |
| Thurston WMA                                                                                                                 | New Gloucester                                                   | Cumberland                         | WMA        | N                  | N                    | N                   | N                            | No visibility due to intervening terrain/vegetation                                                                                                                                                                   | No Impact                                                                                                                                                                                                   |
| Tolla Wolla WMA                                                                                                              | Livermore                                                        | Androscoggin                       | WMA        | Y                  | Y                    | Y                   | Y                            | Overlays determined no views due to intervening vegetation                                                                                                                                                            | No Impact                                                                                                                                                                                                   |
| Androscoggin Lake                                                                                                            | Leeds                                                            | Androscoggin                       | Focus Area | Y                  | Y                    | N                   | Y                            | Not likely due to intervening terrain/vegetation                                                                                                                                                                      | Negligible Impact                                                                                                                                                                                           |
| Attean Pond - Moose River                                                                                                    | Appleton Twp.,<br>Bradstreet Twp.,<br>T5<br>R7 BKP WKR           | Somerset                           | Focus Area | Y                  | Y                    | Y                   | Y                            | Attean Pond - Not likely or heavily filtered due to intervening vegetation<br>Moose River - Viewshed map indicates potential but fieldwork confirmed intervening vegetation will screen within 3 miles of the Project | No Impact                                                                                                                                                                                                   |
| Bald Mountain                                                                                                                | East Moxie Twp.                                                  | Somerset                           | Focus Area | Y                  | N                    | Y                   | Y                            | Summit of Bald Mountain is in Bald Mtn Twp                                                                                                                                                                            | Minimal Impact                                                                                                                                                                                              |
| Bald Mountain                                                                                                                | Bald Mountain Twp. T2 R3                                         | Somerset                           | Focus Area | Y                  | Y                    | Y                   | Y                            | Yes (See Psim C in Appendix E, and Psim 52 Leaf Off/Snow Cover Conditions)                                                                                                                                            | Minimal Impact                                                                                                                                                                                              |
| Cold Stream - West Forks                                                                                                     | West Forks Plt.,<br>Moxie Gore                                   | Somerset                           | Focus Area | Y                  | Y                    | Y                   | Y                            | Yes, along Wilson Hill Road, also visible in Johnson Mountain TWP (See Psim 46)                                                                                                                                       | Minimal Impact                                                                                                                                                                                              |
| Kennebec Estuary                                                                                                             | Dresden, Pittston,<br>Westport Island,<br>Wiscasset,<br>Woolwich | Lincoln,<br>Kennebec,<br>Sagadahoc | Focus Area | N                  | N                    | N                   | N                            | No visibility due to intervening terrain/vegetation                                                                                                                                                                   | No Impact                                                                                                                                                                                                   |
| Kennebec Floodplain - Madison and Anson                                                                                      | Anson, Madison                                                   | Somerset                           | Focus Area | Y                  | Y                    | Y                   | Y                            | Yes, at the junction of the Kennebec and Carrabassett River in North Anson, co-located with existing 115 kV transmission line (See Psim 33)                                                                           | Minimal Impact<br>Floodplains are not Scenic Resources                                                                                                                                                      |
| <b>Table 3. State or Federally Designated Trails within 3 Miles of NECEC</b>                                                 |                                                                  |                                    |            |                    |                      |                     |                              |                                                                                                                                                                                                                       |                                                                                                                                                                                                             |
| Appalachian National Scenic Trail                                                                                            | The Forks Plt.                                                   | Somerset                           | NPS        | Y                  | N                    | Y                   | Y                            | Yes (See Psim A from Pleasant Pond Mountain in Appendix E)                                                                                                                                                            | Minimal Impact                                                                                                                                                                                              |
| Appalachian National Scenic Trail                                                                                            | Bald Mountain Twp. T2 R3,<br>Caratunk                            | Somerset                           | NPS        | Y                  | Y                    | Y                   | Y                            | Yes (See Psim B from Bald Mountain and C from Troutdale Road in Appendix E, and Psim 52 Leaf Off/Snow Cover Conditions)                                                                                               | Minimal Impact – Bald Mountain<br>Moderate/Strong Impact where AT is co-located with Troutdale Road (private road). A buffer planting plan has been developed to mitigate views toward the widened clearing |

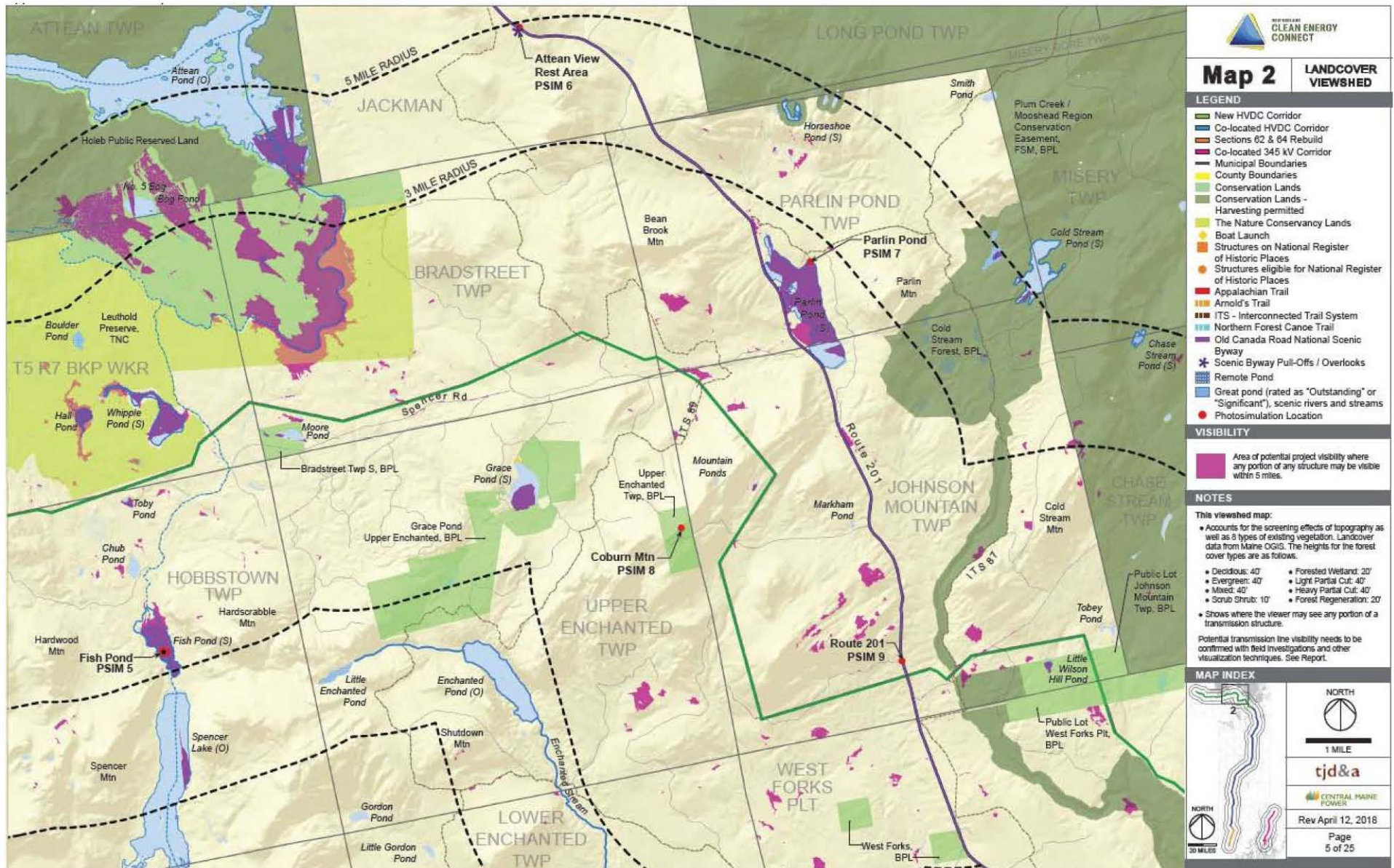


# Viewshed Analysis - topography only (no vegetation) - Excerpt





# Viewshed Analysis - with 40' vegetation - Excerpt





# Fieldwork and Photographic Documentation





# Assess Project Visibility with Computer Analysis Techniques

Attachment E: Evaluation of River / Stream Visibility

Greenline represents top of foreground trees



**Viewpoint 7 (model overlay)** - View looking northwest from the Route 201 Overlook in Solon toward the Project. The top of one structure may be visible from this viewpoint. Red lines represent conductors that are located behind the existing vegetation, except in one location as noted.

**Kennebec River, Embden, Concord Twp, Solon & Bingham**

# Summary of Photosimulations

| SUMMARY OF PHOTOSIMULATIONS |                                                                             |                              |                                 |                                          |                                |                       |                 |                              |                       |                                   |                 |                  |                      |                                          |                                |                                      |
|-----------------------------|-----------------------------------------------------------------------------|------------------------------|---------------------------------|------------------------------------------|--------------------------------|-----------------------|-----------------|------------------------------|-----------------------|-----------------------------------|-----------------|------------------|----------------------|------------------------------------------|--------------------------------|--------------------------------------|
| No.                         | Photosimulation                                                             | Location                     | Viewing Distance Zone           |                                          |                                | Viewpoint Type        |                 |                              |                       |                                   |                 |                  | Surrounding Land use |                                          |                                |                                      |
|                             |                                                                             |                              | Foreground<br>(within 0.5 mile) | Midground<br>(between 0.5 and 3.0 miles) | Background<br>(beyond 3 miles) | Rated*<br>Great Ponds | Remote<br>Ponds | Rated**<br>Rivers<br>Streams | Elevated<br>Viewpoint | Recreation<br>Area/Park/<br>Trail | Scenic<br>Byway | Road<br>Crossing | Working<br>Forest    | Non-<br>Forested<br>Land/<br>Agriculture | Rural<br>Residential<br>/ Camp | Village/<br>Sub-urban<br>Residential |
| SEGMENT 1 NEW HVDC          |                                                                             |                              |                                 |                                          |                                |                       |                 |                              |                       |                                   |                 |                  |                      |                                          |                                |                                      |
| 1                           | Beattie Pond                                                                | <u>Lowelltown Twp.</u>       | •                               |                                          |                                |                       | •               |                              |                       |                                   |                 |                  | •                    |                                          | •                              |                                      |
| 2                           | Wing Pond                                                                   | <u>Lowelltown Twp.</u>       |                                 | •                                        |                                |                       | •               |                              |                       |                                   |                 |                  | •                    |                                          |                                |                                      |
| 3                           | Rock Pond                                                                   | T5 R6 BKP WKR                |                                 | •                                        |                                | •                     |                 |                              |                       |                                   |                 |                  | •                    |                                          | •                              |                                      |
| 4                           | No 5 Mountain/Leuthold Preserve                                             | T5 R7 BKP WKR                |                                 |                                          | •                              |                       |                 |                              | •                     | •                                 |                 |                  | •                    |                                          |                                |                                      |
| 5                           | Fish Pond                                                                   | <u>Hobbs town Twp.</u>       |                                 |                                          | •                              | •                     |                 |                              |                       |                                   |                 |                  | •                    |                                          | •                              |                                      |
| 6                           | Attean View Rest Area                                                       | Jackman                      |                                 |                                          | •                              |                       |                 |                              | •                     |                                   | •               |                  | •                    |                                          |                                |                                      |
| 7                           | Parlin Pond                                                                 | <u>Parlin Pond Twp.</u>      |                                 | •                                        |                                | •                     |                 |                              |                       |                                   |                 |                  | •                    |                                          | •                              |                                      |
| 8                           | Coburn <u>Mtn</u>                                                           | Upper Enchanted Twp.         |                                 | •                                        |                                |                       |                 |                              | •                     | •                                 |                 |                  | •                    |                                          |                                |                                      |
| 9                           | Route 201                                                                   | <u>Johnson Mountain Twp.</u> | •                               |                                          |                                |                       |                 |                              |                       |                                   | •               | •                | •                    |                                          |                                |                                      |
| 10                          | Upper Kennebec River                                                        | Moxie Gore                   | •                               |                                          |                                |                       |                 | •                            |                       | •                                 |                 |                  | •                    |                                          |                                |                                      |
| 11                          | Upper Kennebec River                                                        | Moxie Gore                   | •                               |                                          |                                |                       |                 | •                            |                       | •                                 |                 |                  | •                    |                                          |                                |                                      |
| 12                          | Moxie Stream                                                                | Moxie Gore                   | •                               |                                          |                                |                       |                 | •                            |                       | •                                 |                 |                  | •                    |                                          |                                |                                      |
| 30                          | Kennebec Gorge Crossing, Looking Northwest, 3 structure option              | Moxie Gore                   | •                               |                                          |                                |                       |                 | •                            |                       | •                                 |                 |                  | •                    |                                          |                                |                                      |
| 31                          | Kennebec Gorge Crossing, Looking Southeast, 3 structure option              | Moxie Gore                   | •                               |                                          |                                |                       |                 | •                            |                       | •                                 |                 |                  | •                    |                                          |                                |                                      |
| 32                          | Kennebec Gorge Picnic Area, Looking Southwest, 3 structure Option,          | Moxie Gore                   | •                               |                                          |                                |                       |                 | •                            |                       | •                                 |                 |                  | •                    |                                          |                                |                                      |
| 33                          | Kennebec Gorge North of Picnic Area, Looking Southwest, 3 Structure Option. | Moxie Gore                   | •                               |                                          |                                |                       |                 | •                            |                       | •                                 |                 |                  | •                    |                                          |                                |                                      |
| SEGMENT 2 CO-LOCATED HVDC   |                                                                             |                              |                                 |                                          |                                |                       |                 |                              |                       |                                   |                 |                  |                      |                                          |                                |                                      |
| 13                          | Moxie Pond north                                                            | <u>East Moxie Twp.</u>       | •                               | •                                        |                                | •                     |                 |                              |                       |                                   |                 |                  | •                    |                                          | •                              |                                      |
| 14                          | Moxie Pond north continued view                                             | <u>East Moxie Twp.</u>       | •                               | •                                        |                                | •                     |                 |                              |                       |                                   |                 |                  | •                    |                                          | •                              |                                      |
| 15                          | Moxie Pond south                                                            | <u>Bald Mtn Twp.</u> T2 R3   | •                               |                                          |                                | •                     |                 |                              |                       |                                   |                 |                  | •                    |                                          | •                              |                                      |
| 16                          | Mosquito Mountain                                                           | <u>The Forks Plt</u>         |                                 | •                                        |                                |                       |                 |                              | •                     | •                                 |                 |                  | •                    |                                          | •                              |                                      |
| 17                          | Mosquito Mountain                                                           | <u>The Forks Plt</u>         |                                 | •                                        |                                |                       |                 |                              | •                     | •                                 |                 |                  | •                    |                                          | •                              |                                      |

2018-09-17

# Summary of Photosimulations

| SUMMARY OF PHOTOSIMULATIONS |                                                  |                               |                                    |                                                |                                 |                          |                 |                              |                       |                                   |                 |                  |                                |                                          |                                |                                      |
|-----------------------------|--------------------------------------------------|-------------------------------|------------------------------------|------------------------------------------------|---------------------------------|--------------------------|-----------------|------------------------------|-----------------------|-----------------------------------|-----------------|------------------|--------------------------------|------------------------------------------|--------------------------------|--------------------------------------|
| No.                         | Photosimulation                                  | Location                      | Viewing Distance Zone              |                                                |                                 | Viewpoint Type           |                 |                              |                       |                                   |                 |                  | Surrounding Land use           |                                          |                                |                                      |
|                             |                                                  |                               | Foreground<br>(within 0.5<br>mile) | Midground<br>(between<br>0.5 and 3.0<br>miles) | Background<br>Beyond 3<br>miles | Rated*<br>Great<br>Ponds | Remote<br>Ponds | Rated**<br>Rivers<br>Streams | Elevated<br>Viewpoint | Recreation<br>Area/Park/<br>Trail | Scenic<br>Byway | Road<br>Crossing | Working<br>Forest/<br>Forested | Non-<br>Forested<br>Land/<br>Agriculture | Rural<br>Residential<br>/ Camp | Village/<br>Sub-urban<br>Residential |
| 18                          | Troutdale Road                                   | The Forks <del>Plt</del>      | •                                  |                                                |                                 |                          |                 |                              |                       |                                   |                 | •                | •                              |                                          | •                              |                                      |
| A                           | Appalachian Trail –<br>Pleasant Pond Mountain    | The Forks, <del>Plt</del>     |                                    |                                                | •                               |                          |                 |                              | •                     | •                                 |                 |                  | •                              |                                          |                                |                                      |
| B                           | Appalachian Trail –<br>Troutdale Road            | Bald Mountain <del>Twp</del>  | •                                  |                                                |                                 |                          |                 |                              | •                     | •                                 |                 | •                | •                              |                                          | •                              |                                      |
| C                           | Appalachian Trail –<br>Bald Mountain             | Bald Mountain <del>Twp</del>  |                                    |                                                | •                               |                          |                 |                              | •                     | •                                 |                 |                  | •                              |                                          |                                |                                      |
| 34                          | Carrabassett River                               | Anson                         | •                                  |                                                |                                 |                          |                 |                              |                       |                                   |                 |                  |                                | •                                        | •                              |                                      |
| 35                          | Sandy River                                      | Farmington                    | •                                  |                                                |                                 |                          |                 |                              |                       |                                   |                 |                  |                                | •                                        | •                              |                                      |
| SEGMENT 3 CO-LOCATED HVDC   |                                                  |                               |                                    |                                                |                                 |                          |                 |                              |                       |                                   |                 |                  |                                |                                          |                                |                                      |
| 19                          | Route 201                                        | Moscow                        | •                                  |                                                |                                 |                          |                 |                              |                       |                                   | •               | •                |                                | •                                        |                                | •                                    |
| 20                          | Wyman Lake Recreation Area                       | Pleasant Ridge <del>Plt</del> |                                    | •                                              |                                 |                          |                 |                              |                       | •                                 |                 |                  |                                | •                                        | •                              |                                      |
| 21                          | Route 8                                          | North Anson                   | •                                  |                                                |                                 |                          |                 |                              |                       |                                   |                 | •                |                                | •                                        |                                | •                                    |
| 22                          | Route 2                                          | Farmington                    | •                                  |                                                |                                 |                          |                 |                              |                       |                                   |                 | •                |                                | •                                        |                                | •                                    |
| 23                          | Androscoggin <del>Riverlands</del><br>State Park | Leeds                         | •                                  |                                                |                                 |                          |                 |                              |                       | •                                 |                 | •                | •                              | •                                        | •                              |                                      |
| 24                          | Merrill Road                                     | Lewiston                      | •                                  |                                                |                                 |                          |                 |                              |                       |                                   |                 | •                |                                | •                                        |                                | •                                    |
| SEGMENT 4 REBUILD           |                                                  |                               |                                    |                                                |                                 |                          |                 |                              |                       |                                   |                 |                  |                                |                                          |                                |                                      |
| 25                          | Riverside Drive                                  | Auburn                        | •                                  |                                                |                                 |                          |                 |                              |                       |                                   |                 | •                |                                |                                          | •                              |                                      |
| 26                          | <del>Fickett</del> Road Substation               | <del>Pownal</del>             | •                                  |                                                |                                 |                          |                 |                              |                       |                                   |                 |                  |                                | •                                        | •                              |                                      |
| SEGMENT 5 345 kV            |                                                  |                               |                                    |                                                |                                 |                          |                 |                              |                       |                                   |                 |                  |                                |                                          |                                |                                      |
| 27                          | Route 1                                          | Wiscasset                     | •                                  |                                                |                                 |                          |                 |                              |                       |                                   |                 | •                |                                |                                          |                                | •                                    |
| 28                          | Route 27                                         | Wiscasset                     | •                                  |                                                |                                 |                          |                 |                              |                       |                                   |                 | •                |                                | •                                        | •                              |                                      |
| 29                          | Route 194                                        | Whitefield                    | •                                  |                                                |                                 |                          |                 |                              |                       |                                   |                 | •                |                                | •                                        | •                              |                                      |
| 36                          | West Branch Sheepscot River<br>(Looking West)    | Windsor                       | •                                  |                                                |                                 |                          |                 |                              |                       |                                   |                 |                  |                                | •                                        | •                              |                                      |
| 37                          | West Branch Sheepscot River<br>(Looking North)   | Windsor                       | •                                  |                                                |                                 |                          |                 |                              |                       |                                   |                 |                  |                                | •                                        | •                              |                                      |

2018-09-17



# Summary of Visual Impact Ratings - *based on Chapter 315 Appendix A*

2018-08.10

| Photosimulation No.<br>Resource/Location                                                                        | Reviewer | Landscape Compatibility |      |      |         | Scale<br>Contrast | Spatial<br>Dominance | Total Visual<br>Impact Severity<br>Rating | Average | Visual Impact    |
|-----------------------------------------------------------------------------------------------------------------|----------|-------------------------|------|------|---------|-------------------|----------------------|-------------------------------------------|---------|------------------|
|                                                                                                                 |          | Color                   | Form | Line | Texture |                   |                      |                                           |         |                  |
| 1. Beattie Pond<br>Lowelltown Twp                                                                               | A        | 1                       | 1    | 1    | 0       | 2                 | 2                    | 7                                         | 8.5     | Minimal/Moderate |
|                                                                                                                 | B        | 1                       | 2    | 2    | 0       | 3                 | 2                    | 10                                        |         |                  |
| 2. Wing Pond<br>Lowelltown Twp                                                                                  | A        | 1                       | 1    | 1    | 0       | 0                 | 0                    | 3                                         | 3.5     | Minimal          |
|                                                                                                                 | B        | 0                       | 1    | 1    | 0       | 2                 | 0                    | 4                                         |         |                  |
| 3. Rock Pond<br>T5 R6 BKP WKR                                                                                   | A        | 2                       | 2    | 2    | 1       | 4                 | 4                    | 15                                        | 16.5    | Moderate         |
|                                                                                                                 | B        | 2                       | 1    | 2    | 1       | 8                 | 4                    | 18                                        |         |                  |
| 4. NO.5 Mountain<br>T5 R7 BKP WKR                                                                               | A        | 0                       | 1    | 2    | 0       | 1                 | 2                    | 6                                         | 8.5     | Minimal/Moderate |
|                                                                                                                 | B        | 1                       | 2    | 2    | 0       | 3                 | 3                    | 11                                        |         |                  |
| 5. Fish Pond<br>Hobbs town Twp                                                                                  | A        | 0                       | 1    | 0    | 0       | 0                 | 0                    | 1                                         | 1       | Negligible       |
|                                                                                                                 | B        | 0                       | 0    | 1    | 0       | 1                 | 1                    | 3                                         |         |                  |
| 6. Attean View Rest Area<br>Jackman                                                                             | A        | 0                       | 0    | 1    | 0       | 0                 | 1                    | 2                                         | 1       | Negligible       |
|                                                                                                                 | B        | 0                       | 0    | 0    | 0       | 0                 | 0                    | 0                                         |         |                  |
| 7. Parlin Pond<br>Parlin Pond TWP                                                                               | A        | 1                       | 1    | 1    | 1       | 2                 | 4                    | 10                                        | 9       | Moderate         |
|                                                                                                                 | B        | 1                       | 1    | 1    | 0       | 2                 | 3                    | 8                                         |         |                  |
| 8. Coburn Mountain<br>Upper Enchanted Twp.                                                                      | A        | 1                       | 2    | 2    | 0       | 2                 | 4                    | 11                                        | 12.5    | Moderate         |
|                                                                                                                 | B        | 1                       | 2    | 2    | 1       | 4                 | 4                    | 14                                        |         |                  |
| 9. Route 201<br>Johnson Mountain Twp                                                                            | A        | 1                       | 1    | 1    | 1       | 4                 | 4                    | 12                                        | 12.5    | Moderate         |
|                                                                                                                 | B        | 2                       | 1    | 1    | 1       | 4                 | 4                    | 13                                        |         |                  |
| 10. Upper Kennebec River<br>5 Structure Option, Sept 2017<br>(see Psim 30 for 3 structure option)<br>Moxie Gore | A        | 1                       | 2    | 2    | 1       | 4                 | 4                    | 14                                        | 14.5    | Moderate         |
|                                                                                                                 | B        | 1                       | 2    | 2    | 1       | 4                 | 5                    | 15                                        |         |                  |
| 11. Upper Kennebec River<br>5 Structure Option, Sept 2017<br>Moxie Gore                                         | A        | 1                       | 2    | 2    | 0       | 5                 | 6                    | 16                                        | 15      | Moderate         |
|                                                                                                                 | B        | 1                       | 2    | 2    | 1       | 4                 | 4                    | 14                                        |         |                  |
| 11. Upper Kennebec River<br>3 Structure Option, Dec 2017<br>Moxie Gore                                          | A        | 1                       | 1    | 2    | 0       | 6                 | 4                    | 14                                        | 15.5    | Moderate         |
|                                                                                                                 | B        | 1                       | 1    | 2    | 1       | 6                 | 6                    | 17                                        |         |                  |
| 12. Moxie Stream<br>Moxie Gore                                                                                  | A        | 1                       | 2    | 3    | 2       | 8                 | 6                    | 22                                        | 21      | Strong*          |
|                                                                                                                 | B        | 2                       | 2    | 2    | 2       | 6                 | 6                    | 20                                        |         |                  |
| 13. Moxie Pond North<br>East Moxie Twp                                                                          | A        | 1                       | 1    | 1    | 0       | 2                 | 2                    | 7                                         | 4       | Minimal          |
|                                                                                                                 | B        | 0                       | 0    | 0    | 0       | 1                 | 0                    | 1                                         |         |                  |
| 14. Moxie Pond North<br>East Moxie Twp                                                                          | A        | 1                       | 1    | 1    | 0       | 2                 | 2                    | 7                                         | 5.5     | Minimal          |
|                                                                                                                 | B        | 0                       | 1    | 1    | 0       | 1                 | 1                    | 4                                         |         |                  |



# Summary of Visual Impact Ratings - based on Chapter 315 Appendix A

2018-08.10

| Photosimulation No.<br>Resource/Location                                         | Reviewer | Landscape Compatibility |      |      |         | Scale<br>Contrast | Spatial<br>Dominance | Total Visual<br>Impact Severity<br>Rating | Average | Visual Impact |
|----------------------------------------------------------------------------------|----------|-------------------------|------|------|---------|-------------------|----------------------|-------------------------------------------|---------|---------------|
|                                                                                  |          | Color                   | Form | Line | Texture |                   |                      |                                           |         |               |
| 15. Moxie Pond South (Dec 2017)<br>Bald Mountain TWP T2 R3                       | A        | 1                       | 1    | 1    | 1       | 2                 | 2                    | 8                                         | 9.5     | Moderate      |
|                                                                                  | B        | 1                       | 1    | 1    | 0       | 4                 | 4                    | 11                                        |         |               |
| 16. Mosquito Mountain<br>The Forks PLT                                           | A        | 1                       | 1    | 1    | 1       | 4                 | 2                    | 10                                        | 11      | Moderate      |
|                                                                                  | B        | 1                       | 1    | 1    | 1       | 6                 | 2                    | 12                                        |         |               |
| 17. Mosquito Mountain<br>The Forks PLT                                           | A        | 1                       | 1    | 1    | 1       | 4                 | 2                    | 10                                        | 12      | Moderate      |
|                                                                                  | B        | 1                       | 1    | 1    | 1       | 6                 | 4                    | 14                                        |         |               |
| 18. Troutdale Road<br>The Forks PLT                                              | A        | 1                       | 2    | 1    | 1       | 4                 | 6                    | 15                                        | 14.5    | Moderate      |
|                                                                                  | B        | 1                       | 2    | 2    | 1       | 4                 | 4                    | 14                                        |         |               |
| 19. Route 201<br>Moscow                                                          | A        | 2                       | 2    | 1    | 1       | 4                 | 4                    | 14                                        | 14      | Moderate      |
|                                                                                  | B        | 1                       | 2    | 2    | 1       | 4                 | 4                    | 14                                        |         |               |
| 20. Wyman Lake Recreation Area<br>Pleasant Ridge Plt                             | A        | 1                       | 1    | 1    | 0       | 1                 | 1                    | 5                                         | 7       | Minimal       |
|                                                                                  | B        | 1                       | 1    | 1    | 0       | 2                 | 4                    | 9                                         |         |               |
| 21. Route 8<br>Anson                                                             | A        | 1                       | 2    | 1    | 1       | 4                 | 6                    | 15                                        | 14.5    | Moderate      |
|                                                                                  | B        | 1                       | 2    | 2    | 1       | 4                 | 4                    | 14                                        |         |               |
| 22. Route 2<br>Farmington                                                        | A        | 1                       | 1    | 2    | 1       | 4                 | 6                    | 15                                        | 14      | Moderate      |
|                                                                                  | B        | 1                       | 1    | 2    | 1       | 4                 | 4                    | 13                                        |         |               |
| 23. Androscoggin Riverlands<br>State Park<br>Leeds                               | A        | 1                       | 1    | 1    | 1       | 2                 | 2                    | 8                                         | 10      | Moderate      |
|                                                                                  | B        | 1                       | 1    | 1    | 1       | 4                 | 4                    | 12                                        |         |               |
| 24. Merrill Road<br>Lewiston                                                     | A        | 1                       | 1    | 1    | 1       | 4                 | 4                    | 12                                        | 10.5    | Moderate      |
|                                                                                  | B        | 0                       | 0    | 1    | 0       | 4                 | 4                    | 9                                         |         |               |
| 25. Riverside Drive<br>Auburn                                                    | A        | 2                       | 1    | 1    | 1       | 2                 | 2                    | 9                                         | 12      | Moderate      |
|                                                                                  | B        | 2                       | 2    | 2    | 1       | 4                 | 4                    | 15                                        |         |               |
| 26. Fickett Road Substation<br>Pownal                                            | A        | 1                       | 2    | 2    | 1       | 8                 | 6                    | 20                                        | 16.5    | Moderate*     |
|                                                                                  | B        | 1                       | 1    | 1    | 0       | 6                 | 4                    | 13                                        |         |               |
| 27. Route 1<br>Wiscasset                                                         | A        | 0                       | 0    | 1    | 0       | 0                 | 0                    | 1                                         | 1.5     | Negligible    |
|                                                                                  | B        | 0                       | 0    | 1    | 0       | 1                 | 0                    | 2                                         |         |               |
| 28. Route 27<br>Wiscasset                                                        | A        | 0                       | 0    | 1    | 0       | 4                 | 2                    | 7                                         | 11.5    | Moderate      |
|                                                                                  | B        | 0                       | 0    | 2    | 0       | 6                 | 8                    | 16                                        |         |               |
| 29. Route 194<br>Whitefield                                                      | A        | 0                       | 0    | 1    | 0       | 4                 | 2                    | 7                                         | 11.5    | Moderate      |
|                                                                                  | B        | 0                       | 0    | 2    | 0       | 6                 | 8                    | 16                                        |         |               |
| 30. Upper Kennebec River NW within<br>corridor- 3 Structure option<br>Moxie Gore | A        | 1                       | 1    | 2    | 1       | 6                 | 4                    | 15                                        | 14.5    | Moderate      |
|                                                                                  | B        | 1                       | 2    | 2    | 1       | 4                 | 4                    | 14                                        |         |               |

# Summary of Visual Impact Ratings - *based on Chapter 315 Appendix A*

2018-08.10

| Photosimulation No.<br>Resource/Location                                                  | Reviewer | Landscape Compatibility |      |      |         | Scale<br>Contrast | Spatial<br>Dominance | Total Visual<br>Impact Severity<br>Rating | Average | Visual Impact |
|-------------------------------------------------------------------------------------------|----------|-------------------------|------|------|---------|-------------------|----------------------|-------------------------------------------|---------|---------------|
|                                                                                           |          | Color                   | Form | Line | Texture |                   |                      |                                           |         |               |
| 31. Upper Kennebec River SE within<br>corridor - 3 structure option<br>Moxie Gore         | A        | 1                       | 1    | 2    | 1       | 4                 | 4                    | 13                                        | 13.5    | Moderate      |
|                                                                                           | B        | 1                       | 2    | 2    | 1       | 4                 | 4                    | 14                                        |         |               |
| 32. Upper Kennebec River Picnic Area -<br>SW - 3 structure option<br>Moxie Gore           | A        | 2                       | 2    | 2    | 1       | 6                 | 4                    | 17                                        | 16.5    | Moderate      |
|                                                                                           | B        | 1                       | 2    | 2    | 1       | 4                 | 6                    | 16                                        |         |               |
| 33. Upper Kennebec River - North of<br>the Picnic Area - 3 structure option<br>Moxie Gore | A        | 1                       | 2    | 2    | 1       | 6                 | 4                    | 16                                        | 15.5    | Moderate      |
|                                                                                           | B        | 1                       | 2    | 2    | 1       | 4                 | 5                    | 15                                        |         |               |
| A. Appalachian Trail _ Pleasant Pond<br>Mountain<br>The Forks PLT                         | A        | 0                       | 0    | 1    | 0       | 1                 | 0                    | 2                                         | 3.5     | Minimal       |
|                                                                                           | B        | 1                       | 1    | 0    | 0       | 1                 | 2                    | 5                                         |         |               |
| B. Appalachian Trail - Troutdale Road,<br>Joes Hole<br>Bald Mountain TWP                  | A        | 2                       | 2    | 2    | 1       | 6                 | 8                    | 21                                        | 22      | Strong*       |
|                                                                                           | B        | 2                       | 2    | 2    | 1       | 8                 | 8                    | 23                                        |         |               |
| C. Appalachian Trail - Bald Mountain<br>Bald Mountain TWP                                 | A        | 0                       | 0    | 1    | 0       | 1                 | 0                    | 2                                         | 4       | Minimal       |
|                                                                                           | B        | 1                       | 0    | 1    | 0       | 2                 | 2                    | 6                                         |         |               |

\* Locations have been described further in the attached memo from TJD&A, dated August 10, 2018. Conceptual Buffer Planting Plans will be provided for these (\*) locations by Central Maine Power Company as additional mitigation.

# Summary of Visual Impact Ratings - Leaf Off Snow Cover

2019.01.02

| LEAF-OFF SNOW COVER<br>Photosimulation No. Resource/Location                                | Reviewer | Landscape Compatibility |      |      |         | Scale Contrast | Spatial Dominance | Total Visual Impact Severity Rating | Average | Visual Impact                                                                                              |
|---------------------------------------------------------------------------------------------|----------|-------------------------|------|------|---------|----------------|-------------------|-------------------------------------|---------|------------------------------------------------------------------------------------------------------------|
|                                                                                             |          | Color                   | Form | Line | Texture |                |                   |                                     |         |                                                                                                            |
| 42. Parlin Pond, northern end<br>Parlin Pond TWP                                            | A        | 1                       | 1    | 2    | 1       | 4              | 4                 | 13                                  | 12.5    | Moderate                                                                                                   |
|                                                                                             | B        | 1                       | 1    | 1    | 1       | 4              | 4                 | 12                                  |         |                                                                                                            |
| 43. Route 201, West of Parlin Pond<br>Parlin Pond TWP                                       | A        | 1                       | 1    | 2    | 1       | 4              | 4                 | 13                                  | 12.5    | Moderate                                                                                                   |
|                                                                                             | B        | 1                       | 1    | 1    | 1       | 4              | 4                 | 12                                  |         | Overall low impact to Route 201 due to limited duration                                                    |
| 44. Coburn Mountain<br>Upper Enchanted Twp.                                                 | A        | 2.5                     | 3    | 3    | 2       | 10             | 8                 | 28.5                                | 25.75   | Strong                                                                                                     |
|                                                                                             | B        | 2                       | 2    | 3    | 2       | 8              | 6                 | 23                                  |         | Overall impact moderated when considering 360 degree view.                                                 |
| 44. Coburn Mountain<br>Upper Enchanted Twp.<br>updated with selective vegetation management | A        | 2                       | 2    | 1.5  | 1.5     | 4              | 4                 | 15                                  | 14      | Moderate                                                                                                   |
|                                                                                             | B        | 1                       | 1    | 2    | 1       | 4              | 4                 | 13                                  |         | Reduced impact with proposed vegetation management                                                         |
| 45. ITS 89, North of Spencer Rd<br>Parlin Pond Twp<br>(on Weyerhaeuser land)                | A        | 2                       | 2    | 3    | 2       | 6              | 4                 | 19                                  | 16.5    | Moderate                                                                                                   |
|                                                                                             | B        | 1                       | 2    | 2    | 1       | 4              | 4                 | 14                                  |         | Moderate impact to one point on ITS trail, Overall low impact to trail due to limited duration of exposure |
| 46. ITS 87, Cold Stream Forest Parcel<br>Johnson Mountain Twp                               | A        | 1.5                     | 2    | 2    | 2       | 4              | 4                 | 15.5                                | 15.75   | Moderate                                                                                                   |
|                                                                                             | B        | 2                       | 1    | 1    | 2       | 6              | 4                 | 16                                  |         | View from bridge is limited, adjacent to Capital Road                                                      |



# Summary of Visual Impact Ratings - Leaf Off Snow Cover

2019.01.02

| LEAF-OFF SNOW COVER<br>Photosimulation No. Resource/Location                                      | Reviewer | Landscape Compatibility |      |      |         | Scale Contrast | Spatial Dominance | Total Visual Impact Severity Rating | Average | Visual Impact                                                                                           |
|---------------------------------------------------------------------------------------------------|----------|-------------------------|------|------|---------|----------------|-------------------|-------------------------------------|---------|---------------------------------------------------------------------------------------------------------|
|                                                                                                   |          | Color                   | Form | Line | Texture |                |                   |                                     |         |                                                                                                         |
| 47. Cold Stream Mountain<br>(local snowmobile trail)<br>Johnson Mtn Twp<br>(on Weyerhaeuser land) | A        | 2                       | 2    | 2    | 1       | 4              | 2                 | 13                                  | 11      | Moderate                                                                                                |
|                                                                                                   | B        | 1                       | 1    | 2    | 1       | 2              | 2                 | 9                                   |         | View will be significantly reduced within a few years with growth of foreground vegetation.             |
| 48. Mosquito Mtn - Northeast<br>The Forks Plt (on Bayroot LLC land)                               | A        | 1                       | 2    | 2.5  | 1.5     | 6              | 6                 | 19                                  | 19      | Strong                                                                                                  |
|                                                                                                   | B        | 1                       | 2    | 3    | 1       | 6              | 6                 | 19                                  |         | High Moderate overall due to visibility of the existing transmission line                               |
| 49. Mosquito Mtn - Southeast<br>The Forks Plt (on Bayroot LLC land)                               | A        | 1                       | 1.5  | 1.5  | 1       | 4              | 4                 | 13                                  | 13.5    | Moderate                                                                                                |
|                                                                                                   | B        | 1                       | 2    | 2    | 1       | 4              | 4                 | 14                                  |         |                                                                                                         |
| 50. Troutdale Road<br>Bald Mountain Twp                                                           | A        | 1                       | 1.5  | 2    | 1       | 8              | 8                 | 21.5                                | 19.25   | Strong                                                                                                  |
|                                                                                                   | B        | 1                       | 2    | 1    | 1       | 6              | 6                 | 17                                  |         | Moderated with proposed with road side buffering                                                        |
| 51. Appalachian Trail - Bald Mountain - Southwest<br>Bald Mountain TWP                            | A        | 1                       | 1    | 2    | 1       | 6              | 6                 | 17                                  | 15      | Moderate                                                                                                |
|                                                                                                   | B        | 1                       | 1    | 2    | 1       | 4              | 4                 | 13                                  |         | Moderate incremental increase of transmission line visibility in the background, overall minimal impact |
| 52. Appalachian Trail - Bald Mountain - Northwest<br>Bald Mountain TWP                            | A        | 1.5                     | 1.5  | 2    | 1       | 2              | 4                 | 12                                  | 10      | Moderate                                                                                                |
|                                                                                                   | B        | 1                       | 1    | 1    | 1       | 2              | 2                 | 8                                   |         |                                                                                                         |
| 53. Route 201<br>Moscow                                                                           | A        | 1                       | 1    | 1    | 1       | 4              | 4                 | 12                                  | 13      | Moderate                                                                                                |
|                                                                                                   | B        | 1                       | 1    | 1    | 1       | 4              | 6                 | 14                                  |         |                                                                                                         |

# Mitigation Recommendations

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## 1. Overall Project Siting

- Siting of Segment 1 in commercial forest
- Co-locating in Segments 2 and 3
- Rebuilding of Segment 4 - Effective use of existing transmission corridors
- Co-locating Segment 5 345 kV transmission line

## 2. HDD under Kennebec River, siting of Termination Stations

## 3. Use of self-weathering steel structure

## 4. Re-engineering to reduce structure heights

## 5. Non-specular conductors (Rock Pond)

## 6. Tapered vegetation management (Rock Pond and Coburn Mtn)

## 7. Preserving riparian vegetation

## 8. Maintaining roadside vegetation

## 9. Buffer Plantings (Route 201, Troutdale/AT, Moxie Stream)

## 10. Maximizing structure setbacks from roads and streams

## 11. Upgrade existing substations within footprints

## 12. Siting the Merrill Road Converter Station setback from road

# Road Buffer Evaluation Summary - Excerpt

| ROAD BUFFER EVALUATION SUMMARY<br>SEGMENT 1                                                                                                                                                                                                                                                                     |                                                       |           | A. Type of Road / Number of Viewers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | B. Degree of Visible Change to Existing Conditions | C. Length of Exposure Following Installation/Rebuild/Upgrade | D. Existing Screening Vegetation to be Removed | E. Corridor Alignment | TOTAL POINTS                                                                                                                                                                                          | Scenic Quality / Community Character (High, Medium, Common, Low) | Prelim Buffer Recommendation: (Full, Light (L), Further Assess of Need / Effectiveness, (FA) or None (N)) | 1. Present land uses preclude effective buffers                                                                                                                                                                                                                                                                                                                                                                                                      | 2. Environmental factors preclude buffers | 3. Other factors preclude buffers | 4. Buffer plantings would seem out of place | 5. Buffers would block views of scenic resources | 6. Possible to minimize visual impacts by buffers?                                                                                                                                                                                                              | Buffer Recommendation: Yes / No | Notes                                                                                                                                                                                                  |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------|-----------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|-----------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------|-----------------------------------|---------------------------------------------|--------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TOWN                                                                                                                                                                                                                                                                                                            | ROAD                                                  | Ownership |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |                                                    |                                                              |                                                |                       |                                                                                                                                                                                                       |                                                                  |                                                                                                           |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                           |                                   |                                             |                                                  |                                                                                                                                                                                                                                                                 |                                 |                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                 | Unnamed haul road 3                                   | Private   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 5                     | 15                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                 | Unnamed haul road 4                                   | Private   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 5                     | 15                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road                                                                                                                                                                            |
| Parlin Pond Twp                                                                                                                                                                                                                                                                                                 | Spencer Road (Hardscrabble Road)                      | Private   | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 3                     | 14                                                                                                                                                                                                    | M                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Regenerating forest on either side, close to Piet Brook                                                                                                                                                |
| Johnson Mountain Twp                                                                                                                                                                                                                                                                                            | Coburn Mountain access road / Enchanted Mountain Road | Private   | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 5                     | 16                                                                                                                                                                                                    | M                                                                | FA                                                                                                        | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                  | No                                        | No                                | Yes                                         | No                                               | No                                                                                                                                                                                                                                                              | NO                              | In between Coburn and Johnson Mtn, ITS trail, Private road primarily used for timber harvesting operations, buffers would be out of place and potentially sited in locations of future lay down areas. |
|                                                                                                                                                                                                                                                                                                                 | Judd Road                                             | Private   | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 5                     | 16                                                                                                                                                                                                    | M                                                                | FA                                                                                                        | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                  | No                                        | No                                | Yes                                         | No                                               | No                                                                                                                                                                                                                                                              | NO                              | South of Johnson Mtn, Private road primarily used for timber harvesting operations, buffers would be out of place and potentially sited in locations of future lay down areas.                         |
|                                                                                                                                                                                                                                                                                                                 | Route 201                                             | Public    | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 5                                                  | 5                                                            | 5                                              | 5                     | 24                                                                                                                                                                                                    | H                                                                | Full                                                                                                      | No                                                                                                                                                                                                                                                                                                                                                                                                                                                   | No                                        | No                                | No                                          | No                                               | Yes                                                                                                                                                                                                                                                             | YES                             | Rated as High because it is Scenic Quality. A full buffer of non-capable vegetation is recommended on both sides of Route 201 due to its high volume and designation as a National Scenic Byway.       |
|                                                                                                                                                                                                                                                                                                                 | Capital Road                                          | Private   | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 5                                                            | 3                                              | 3                     | 16                                                                                                                                                                                                    | M                                                                | FA                                                                                                        | Yes                                                                                                                                                                                                                                                                                                                                                                                                                                                  | No                                        | No                                | Yes                                         | No                                               | No                                                                                                                                                                                                                                                              | NO                              | Timber Harvesting haul road. View of Cold Stream, Cold Stream Forest, surrounding hills, active harvesting area precludes a buffer, Riparian stream buffer will remain                                 |
|                                                                                                                                                                                                                                                                                                                 | Wilson Hill Road                                      | Private   | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 5                     | 16                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                 | Mountain Brook Road                                   | Private   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 3                     | 13                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                 | Unnamed haul road 1                                   | Private   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 3                     | 13                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                 | Unnamed haul road 2                                   | Private   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 5                     | 15                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                 | Unnamed haul road 3                                   | Private   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 5                     | 15                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                 | Unnamed haul road 4                                   | Private   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 5                     | 15                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                 | Unnamed haul road 5                                   | Private   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 5                     | 15                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                 | Unnamed haul road 6                                   | Private   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 5                     | 15                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                 | Unnamed haul road 7                                   | Private   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 5                     | 15                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road                                                                                                                                                                            |
| West Forks Twp                                                                                                                                                                                                                                                                                                  | Unnamed haul road 1                                   | Private   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 5                     | 15                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road, close to Cold Stream Forest                                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                 | Unnamed haul road 2                                   | Private   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 5                     | 15                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road, close to Cold Stream Forest                                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                 | Unnamed haul road 3                                   | Private   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 5                     | 15                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road, close to Cold Stream Forest                                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                 | Unnamed haul road 4                                   | Private   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 3                     | 13                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Timber Harvesting haul road, close to Cold Stream Forest                                                                                                                                               |
| Moxie Gore                                                                                                                                                                                                                                                                                                      | Fish Pond Road                                        | Private   | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | 4                                                  | 3                                                            | 3                                              | 3                     | 14                                                                                                                                                                                                    | C                                                                | N                                                                                                         | -                                                                                                                                                                                                                                                                                                                                                                                                                                                    | -                                         | -                                 | -                                           | -                                                | -                                                                                                                                                                                                                                                               | NO                              | Crossing location is not in view of Moxie Stream                                                                                                                                                       |
| A. Type of Road / Number of Viewers<br>0: Unimproved road / Lightly traveled<br>1: Other Passable Road / Lightly traveled<br>2: Local Road / Moderately traveled<br>3: Secondary State Route / Moderately traveled<br>4: Primary Route / High traffic volume<br>5: Limited Access Highway / High traffic volume |                                                       |           | B. Degree of Visible Change to Existing Conditions<br>0: 0: No visible change to the transmission corridor or transmission structures<br>1: Minor change with minimal vegetation clearing, or only conductors change<br>2: Minor change: a new or replacement structure within existing cleared corridor<br>3: Moderate change: one existing 115 kV line and a new HVDC/345kV, or existing corridor widened by 75-150'<br>4: Significant change: new HVDC structures within existing clearing/clear cut<br>5: Significant change: new 150' wide cleared corridor, new HVDC structures |                                                    |                                                              |                                                |                       | C. Length of Exposure Following Upgrade<br>1: Transmission corridor visible for < 3 seconds<br>3: Transmission corridor visible for 3 - 8 seconds<br>5: Transmission corridor visible for > 8 seconds |                                                                  |                                                                                                           | D. Existing Screening Vegetation to be Removed<br>0: No vegetation would be lost by proposed activity<br>1: Minor shrubby/woody vegetation would be removed<br>2: Scattered clumps of trees/large shrubs which now screen the ROW would be lost<br>3: Active timber harvesting area/regenerating forest cover<br>4: Removal of 75' of vegetation that screens the existing cleared corridor<br>5: Significant loss of effective screening vegetation |                                           |                                   |                                             |                                                  | E. Corridor Alignment<br>0: Abrupt change in alignment or topography within one structure or within 1/4 mile<br>3: Significant change in alignment or topography within 1/4 to one mile<br>5: No visible change in corridor alignment (straight line alignment) |                                 |                                                                                                                                                                                                        |

2018.10.19



# Road Buffer Evaluation Summary - Excerpt

| ROAD BUFFER EVALUATION SUMMARY<br>SEGMENT 2 |                                        |           | A. Type of Road / Number of Viewers | B. Degree of Visible Change to Existing Conditions | C. Length of Exposure Following Installation/Rebuild/Upgrade | D. Existing Screening Vegetation to be Removed | E. Corridor Alignment | TOTAL POINTS | Scenic Quality / Community Character (High, Medium, Common, Low) | Prelim Buffer Recommendation: (Full, Light (L), Further Assess of Need / Effectiveness (FA) or None (N)) | 1. Present land uses preclude effective buffers. | 2. Environmental factors preclude buffers. | 3. Other factors preclude buffers. | 4. Buffer plantings would seem out of place. | 5. Buffers would block views of scenic resources. | 6. Possible to minimize visual impacts with buffers? | Buffer Recommendation: Yes / No | Notes                                                                                                                                                                                                                                                                                                         |
|---------------------------------------------|----------------------------------------|-----------|-------------------------------------|----------------------------------------------------|--------------------------------------------------------------|------------------------------------------------|-----------------------|--------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------|------------------------------------|----------------------------------------------|---------------------------------------------------|------------------------------------------------------|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TOWN                                        | ROAD                                   | Ownership |                                     |                                                    |                                                              |                                                |                       |              |                                                                  |                                                                                                          |                                                  |                                            |                                    |                                              |                                                   |                                                      |                                 |                                                                                                                                                                                                                                                                                                               |
| The Forks Plt                               | Hodges Road                            | Private   | 0                                   | 3                                                  | 3                                                            | 3                                              | 3                     | 12           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | Access road to timber harvesting area.                                                                                                                                                                                                                                                                        |
|                                             | Troutdale Road                         | Public    | 1                                   | 3                                                  | 5                                                            | 3                                              | 3                     | 15           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | Road within existing corridor for approximately 1,000 ft                                                                                                                                                                                                                                                      |
|                                             | Unnamed haul road 1                    | Private   | 0                                   | 3                                                  | 3                                                            | 3                                              | 3                     | 12           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | Access road to timber harvesting area.                                                                                                                                                                                                                                                                        |
|                                             | Unnamed haul road 2                    | Private   | 0                                   | 3                                                  | 3                                                            | 3                                              | 3                     | 12           | M                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | Access road to timber harvesting area.                                                                                                                                                                                                                                                                        |
|                                             | Mosquito Pond Road                     | Private   | 0                                   | 3                                                  | 3                                                            | 3                                              | 3                     | 12           | M                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | Access road to timber harvesting area and Mosquito Pond which is a rated great pond, proximate to Mosquito Mtn but can't see from roads. Can see distant ridge.                                                                                                                                               |
|                                             | Unnamed haul road 4                    | Private   | 0                                   | 3                                                  | 3                                                            | 3                                              | 3                     | 12           | M                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | Access road to timber harvesting area, adjacent to stream                                                                                                                                                                                                                                                     |
| Bald Mountain Twp                           | Little Sandy Stream Rd                 | Private   | 1                                   | 3                                                  | 3                                                            | 3                                              | 5                     | 15           | M                                                                | FA                                                                                                       | Yes                                              | Yes                                        | No                                 | No                                           | Yes                                               | No                                                   | NO                              | Access road to timber harvesting area, adjacent to Sandy Stream and views down ex transmission line toward south end of Moxie Pond, buffer not effective because of topography and stream.                                                                                                                    |
|                                             | Troutdale/Trestle Road near Joe's Hole | Public    | 1                                   | 3                                                  | 3                                                            | 4                                              | 3                     | 14           | H                                                                | L                                                                                                        | No                                               | Maybe                                      | No                                 | No                                           | Yes                                               | Yes                                                  | YES                             | Rated as High because adjacent to Moxie Pond/Joe's Hole, and co-located with the Appalachian Trail, topography limits views to the north. Light buffer recommended on southeast side of Road. Will reduce view of Joe's Hole from the road. Limited area between road and Joe's Hole will limit buffer width. |
|                                             | Little Austin Pond Access Road         | Private?  | 1                                   | 3                                                  | 3                                                            | 4                                              | 5                     | 16           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | Access to timber harvesting and Austin Pond, no camps                                                                                                                                                                                                                                                         |
|                                             | Troutdale/Trestle Road                 | Public    | 1                                   | 3                                                  | 3                                                            | 4                                              | 5                     | 16           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | Access road to timber harvesting areas, east of Baker Stream                                                                                                                                                                                                                                                  |
|                                             | Unnamed haul road 1                    | Private   | 0                                   | 3                                                  | 3                                                            | 3                                              | 3                     | 12           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | Access road to timber harvesting area.                                                                                                                                                                                                                                                                        |
| Moscow                                      | Heald Pond Road                        | Private   | 1                                   | 3                                                  | 3                                                            | 3                                              | 5                     | 15           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | Access to timber harvesting, Heald Ponds (1+/- camp on pond) and Moxie Mtn trail                                                                                                                                                                                                                              |
|                                             | Chase Pond Road                        | Private   | 1                                   | 3                                                  | 3                                                            | 3                                              | 5                     | 15           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | Access to timber harvesting and camps on Chase Pond (13+/- camps)                                                                                                                                                                                                                                             |
|                                             | Stream Rd #1                           | Public    | 1                                   | 3                                                  | 5                                                            | 4                                              | 3                     | 16           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | Adjacent to Moscow Air Force Radar fields, access timber harvesting roads, Bingham Wind Project visible, existing transmission line                                                                                                                                                                           |
|                                             | Stream Rd #2/Chase Pond Road           | Public    | 1                                   | 3                                                  | 5                                                            | 4                                              | 5                     | 18           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | Project Parallel to Stream Road, access timber harvesting roads                                                                                                                                                                                                                                               |
|                                             | Wolf Mountain Pass Rd                  | Private   | 0                                   | 3                                                  | 3                                                            | 4                                              | 5                     | 15           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | Woods road to top of hill, no houses, ex transmission line cleared corridor right up to edge of road. Not possible to buffer                                                                                                                                                                                  |
|                                             | Bassett Ln                             | Private   | 1                                   | 3                                                  | 3                                                            | 4                                              | 5                     | 16           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | No adjacent houses, dead end                                                                                                                                                                                                                                                                                  |
|                                             | Henry Beadoin Rd                       | Private   | 1                                   | 3                                                  | 3                                                            | 4                                              | 5                     | 16           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | No adjacent houses, road leads to a farmstead, dead end, ex transmission line allows views to nearby hills.                                                                                                                                                                                                   |
|                                             | Burns Rd                               | Public    | 1                                   | 3                                                  | 3                                                            | 4                                              | 5                     | 16           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | One house adjacent, connects t Pierce Hill Road                                                                                                                                                                                                                                                               |
|                                             | Domigan Road                           | Public    | 2                                   | 3                                                  | 3                                                            | 4                                              | 5                     | 17           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                    | NO                              | An existing wooded buffer would remain between 15+/- house and the transmission corridor                                                                                                                                                                                                                      |
|                                             | Route 201                              | Public    | 4                                   | 3                                                  | 3                                                            | 4                                              | 3                     | 17           | H                                                                | L                                                                                                        | No                                               | No                                         | No                                 | No                                           | No                                                | Yes                                                  | YES                             | Rated as High because it is a Scenic Byway, though this area is of less Scenic Quality because of existing utility infrastructure, Light buffer recommended                                                                                                                                                   |

**A. Type of Road / Number of Viewers**  
 0: Unimproved road / Lightly traveled  
 1: Other Passable Road / Lightly traveled  
 2: Local Road / Moderately traveled  
 3: Secondary State Route / Moderately traveled  
 4: Primary Route / High traffic volume  
 5: Limited Access Highway / High traffic volume

**B. Degree of Visible Change to Existing Conditions**  
 0: No visible change to the transmission corridor or transmission structures  
 1: Minor change: a new structure within existing cleared corridor  
 2: Minor change with minimal vegetation clearing  
 3: Moderate change: one existing 115 kV line and a new HVDC/345 kV, or existing corridor widened by 75'-150'  
 4: Significant change: new HVDC structures within existing clearing/clear cut  
 5: Significant change: new 150' wide cleared corridor, new HVDC structures

**C. Length of Exposure Following Upgrade**  
 1: Transmission corridor visible for < 3 seconds  
 3: Transmission corridor visible for 3 - 8 seconds  
 5: Transmission corridor visible for > 8 seconds

**D. Existing Screening Vegetation to be Removed**  
 0: No vegetation would be lost by proposed activity  
 1: Minor shrubby/woody vegetation would be removed  
 2: Scattered clumps of trees/large shrubs which now screen the ROW would be lost  
 3: Active timber harvesting area/regenerating forest cover  
 4: Removal of 75' of vegetation that screens the existing cleared corridor  
 5: Significant loss of effective screening vegetation

**E. Corridor Alignment**  
 0: Abrupt change in alignment or topography within one structure or within 1/4 mile  
 3: Significant change in alignment or topography within 1/4 to one mile  
 5: No visible change in corridor alignment (straight line alignment)

2018.10.19



# Road Buffer Evaluation Summary - Excerpt

| ROAD BUFFER EVALUATION SUMMARY<br>SEGMENT 3                                                                                                                                                                                                                                                                     |                                    |           | A. Type of Road / Number of Viewers                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | B. Degree of Visible Change to Existing Conditions | C. Length of Exposure Following Installation/ Rebuild/ Upgrade | D. Existing Screening Vegetation to be Removed                                                                                                                                                        | E. Corridor Alignment | TOTAL POINTS | Scenic Quality / Community Character (High, Medium, Common, Low)                                                                                                                                                                                                                                                                                                                                                                                     | Prelim Buffer Recommendation (Full, Light (L), Further Assess of Need / Effectiveness, (FA) or None (N)) | 1. Present land uses preclude effective buffers. | 2. Environmental factors preclude buffers.                                                                                                                                                                                                                  | 3. Other factors preclude buffers. | 4. Buffer plantings would seem out of place. | 5. Buffers would block views of scenic resources. | 6. Not Possible to minimize visual impacts by buffers? | Buffer Recommendation: Yes / No | Notes                                                                                                                                                                                                                                                                                                      |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|-----------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------|----------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------|----------------------------------------------|---------------------------------------------------|--------------------------------------------------------|---------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TOWN                                                                                                                                                                                                                                                                                                            | ROAD                               | Ownership |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                    |                                                                |                                                                                                                                                                                                       |                       |              |                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                          |                                                  |                                                                                                                                                                                                                                                             |                                    |                                              |                                                   |                                                        |                                 |                                                                                                                                                                                                                                                                                                            |
| Starks                                                                                                                                                                                                                                                                                                          | Redneck Road                       | Private   | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 4                                                                                                                                                                                                     | 5                     | 18           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Gravel private road to several homes, wooded area                                                                                                                                                                                                                                                          |
|                                                                                                                                                                                                                                                                                                                 | Mayhew Road                        | Public    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 4                                                                                                                                                                                                     | 5                     | 18           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Gravel public road crossing, wooded area                                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                                 | W. Mills Road                      | Public    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 4                                                                                                                                                                                                     | 5                     | 18           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Gravel public road crossing, wooded area                                                                                                                                                                                                                                                                   |
| Industry                                                                                                                                                                                                                                                                                                        | Industry Road (Route 43)           | Public    | 3                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 3                                                              | 4                                                                                                                                                                                                     | 5                     | 18           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Paved secondary route crossing, wooded area, scattered houses                                                                                                                                                                                                                                              |
|                                                                                                                                                                                                                                                                                                                 | Bailey Road                        | Public    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 3                                                              | 4                                                                                                                                                                                                     | 5                     | 16           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Gravel public road crossing, wooded area, scattered houses                                                                                                                                                                                                                                                 |
| New Sharon                                                                                                                                                                                                                                                                                                      | Goodrich Road                      | Public?   | 0                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 4                                                                                                                                                                                                     | 5                     | 17           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Rough backwoods road, wooded area, scattered houses                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                 | Clearwater Road                    | Public    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 3                                                              | 4                                                                                                                                                                                                     | 5                     | 16           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Gravel public road crossing, wooded area, scattered houses                                                                                                                                                                                                                                                 |
| Farmington                                                                                                                                                                                                                                                                                                      | Unnamed drive                      | Private   | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 4                                                                                                                                                                                                     | 5                     | 18           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Gravel private road to 2 homes and out buildings, open fields and woods                                                                                                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                 | Perham Hill Road                   | Public    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 4                                                                                                                                                                                                     | 5                     | 19           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Paved local road crossing, fields and woods nearby, scattered farm houses                                                                                                                                                                                                                                  |
|                                                                                                                                                                                                                                                                                                                 | Osborne Road                       | Public    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 4                                                                                                                                                                                                     | 5                     | 18           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Gravel local road crossing, eastern views, agricultural fields directly adjacent, and woods nearby, scattered houses. Buffer would be out of place in fields and block views                                                                                                                               |
|                                                                                                                                                                                                                                                                                                                 | Bailey Hill Road                   | Public    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 4                                                                                                                                                                                                     | 5                     | 19           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Paved local road crossing, fields and woods nearby, NE farm character area                                                                                                                                                                                                                                 |
|                                                                                                                                                                                                                                                                                                                 | Davis Road                         | Public    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 2                                                                                                                                                                                                     | 5                     | 16           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Gravel local road crossing, fields and woods nearby, NE farm character area                                                                                                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                 | Farmington Falls Road (US Route 2) | Public    | 4                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 3                                                              | 4                                                                                                                                                                                                     | 5                     | 19           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Paved secondary route crossing, developed area, mixed fields and woods, views to north of substation 600' from road. While scoring doesn't result in a buffer recommendation, consider vegetation management that allows non-capable roadside vegetation to grow to screen view toward existing substation |
|                                                                                                                                                                                                                                                                                                                 | Whittier Road                      | Public    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 4                                                                                                                                                                                                     | 3                     | 17           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Paved local road crossing, views of distant hills, agricultural fields adjacent, woods nearby, NE farm character. Buffer would block views of distant hills                                                                                                                                                |
|                                                                                                                                                                                                                                                                                                                 | Knowlton Corner Road               | Public    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 4                                                                                                                                                                                                     | 5                     | 19           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Paved local road crossing, fields and woods nearby, nice NE farm character area                                                                                                                                                                                                                            |
|                                                                                                                                                                                                                                                                                                                 | Webster Road                       | Public    | 1                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 4                                                                                                                                                                                                     | 5                     | 18           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Gravel local road crossing, wooded area with fields nearby                                                                                                                                                                                                                                                 |
| Wilton                                                                                                                                                                                                                                                                                                          | McCrillis Corner Road              | Public    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 2                                                                                                                                                                                                     | 5                     | 17           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Paved local road crossing, views of distant hills looking over road to south, open fields and woods adjacent, NE farm character area.                                                                                                                                                                      |
| Chesterville                                                                                                                                                                                                                                                                                                    | Wilton Road (Route 156)            | Public    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 2                                                                                                                                                                                                     | 5                     | 17           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Paved local road crossing, fields and woods nearby                                                                                                                                                                                                                                                         |
| Jay                                                                                                                                                                                                                                                                                                             | Soules Hill Road                   | Public    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 5                                                              | 4                                                                                                                                                                                                     | 5                     | 19           | M                                                                                                                                                                                                                                                                                                                                                                                                                                                    | FA                                                                                                       | No                                               | No                                                                                                                                                                                                                                                          | Yes                                | Yes                                          | No                                                | No                                                     | No                              | Paved local road crossing, expansive northern vista, fields and woods nearby, buffer would block distant views as seen from road, No Buffer Recommended                                                                                                                                                    |
|                                                                                                                                                                                                                                                                                                                 | Plaisted Road                      | Public    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 3                                                              | 4                                                                                                                                                                                                     | 5                     | 17           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Paved local road crossing, wooded area, scattered houses                                                                                                                                                                                                                                                   |
|                                                                                                                                                                                                                                                                                                                 | Belanger Road                      | Public    | 2                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | 3                                                  | 3                                                              | 4                                                                                                                                                                                                     | 5                     | 17           | C                                                                                                                                                                                                                                                                                                                                                                                                                                                    | N                                                                                                        | -                                                | -                                                                                                                                                                                                                                                           | -                                  | -                                            | -                                                 | -                                                      | No                              | Paved local road crossing, wooded area, scattered houses                                                                                                                                                                                                                                                   |
| A. Type of Road / Number of Viewers<br>0: Unimproved road / Lightly traveled<br>1: Other Passable Road / Lightly traveled<br>2: Local Road / Moderately traveled<br>3: Secondary State Route / Moderately traveled<br>4: Primary Route / High traffic volume<br>5: Limited Access Highway / High traffic volume |                                    |           | B. Degree of Visible Change to Existing Conditions<br>0: No visible change to the transmission corridor or transmission structures<br>1: Minor change with minimal vegetation clearing, or only conductors change<br>2: Minor change: a new or replacement structure within existing cleared corridor<br>3: Moderate change: one existing 115 kV line and a new HVDC/345kV, or existing corridor widened by 75-150'<br>4: Significant change: new HVDC structures within existing clearing/clear cut<br>5: Significant change: new 150' wide cleared corridor, new HVDC structures |                                                    |                                                                | C. Length of Exposure Following Upgrade<br>1: Transmission corridor visible for < 3 seconds<br>3: Transmission corridor visible for 3 - 8 seconds<br>5: Transmission corridor visible for > 8 seconds |                       |              | D. Existing Screening Vegetation to be Removed<br>0: No vegetation would be lost by proposed activity<br>1: Minor shrubby/woody vegetation would be removed<br>2: Scattered clumps of trees/large shrubs which now screen the ROW would be lost<br>3: Active timber harvesting area/regenerating forest cover<br>4: Removal of 75' of vegetation that screens the existing cleared corridor<br>5: Significant loss of effective screening vegetation |                                                                                                          |                                                  | E. Corridor Alignment<br>0: Abrupt change in alignment or topography within one structure or within ¼ mile<br>3: Significant change in alignment or topography within ¼ to one mile<br>5: No visible change in corridor alignment (straight line alignment) |                                    |                                              |                                                   |                                                        |                                 |                                                                                                                                                                                                                                                                                                            |

2018.10.19

# Road Buffer Evaluation Summary - Excerpt

| ROAD BUFFER EVALUATION SUMMARY<br>SEGMENT 4 |                                             |           | A. Type of Road / Number of Viewers | B. Degree of Visible Change to Existing Conditions | C. Length of Exposure Following Installation/ Rebuild/Upgrade | D. Existing Screening Vegetation to be Removed | E. Corridor Alignment | TOTAL POINTS | Scenic Quality / Community Character (High, Medium, Common, Low) | Prelim. Buffer Recommendation: (Full, Light (L), Further Assess of Need Effectiveness, (FA) or None (N)) | 1. Present land uses preclude effective buffers. | 2. Environmental factors preclude buffers. | 3. Other factors preclude buffers. | 4. Buffer plantings would seem out of place. | 5. Buffers would block views of scenic resources. | 6. Not Possible to minimize visual impacts by buffers? | Buffer Recommendation: Yes / No | Notes                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|---------------------------------------------|---------------------------------------------|-----------|-------------------------------------|----------------------------------------------------|---------------------------------------------------------------|------------------------------------------------|-----------------------|--------------|------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------|--------------------------------------------------|--------------------------------------------|------------------------------------|----------------------------------------------|---------------------------------------------------|--------------------------------------------------------|---------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| TOWN                                        | ROAD                                        | Ownership |                                     |                                                    |                                                               |                                                |                       |              |                                                                  |                                                                                                          |                                                  |                                            |                                    |                                              |                                                   |                                                        |                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                             | Auburn Pownal Road                          | Public    | 2                                   | 2                                                  | 3                                                             | 0                                              | 5                     | 12           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                      | No                              | Ex 350 ft wide corridor                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                             | Durham Road                                 | Public    | 1                                   | 2                                                  | 3                                                             | 0                                              | 5                     | 11           | C                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                      | No                              | Ex 350 ft wide corridor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| Pownal                                      | Fickett Road                                | Public    | 2                                   | 2                                                  | 5                                                             | 2                                              | 5                     | 16           | L                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                      | No                              | From crossing of Fickett, view of proposed Fickett Road Substation. Filtered view of corridor east of crossing.                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                             | Fickett Road – north of Proposed Substation | Public    | 2                                   | 4                                                  | 5                                                             | 2                                              | 5                     | 18           | L                                                                | N*                                                                                                       |                                                  |                                            |                                    |                                              |                                                   |                                                        | Yes                             | From north of Fickett Road Substation. Minimal deciduous vegetation exists. Proposed substation creates a Significant change but seen in context of existing Surowiec Substation and transmission lines. *This evaluation does not result in the need for a buffer primarily due to the 'Low' Scenic Quality designation, however, CMP has prepared and submitted a Buffer Planting Plan to respond to potential impacts to immediate abutters to the north of the proposed substation site and because the MPRP established a precedent for screening new substations. |
|                                             | Allen Road                                  | Public    | 2                                   | 2                                                  | 5                                                             | 0                                              | 5                     | 14           | L                                                                | N                                                                                                        | -                                                | -                                          | -                                  | -                                            | -                                                 | -                                                      | No                              | Passes through and adjacent to Fickett Road Substation. Runs adjacent to corridor.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |

|                                                                                                                                                                                                                                                                                                                        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                                                                                                                                        |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A. Type of Road / Number of Viewers</b><br>0: Unimproved road / Lightly traveled<br>1: Other Passable Road / Lightly traveled<br>2: Local Road / Moderately traveled<br>3: Secondary State Route / Moderately traveled<br>4: Primary Route / High traffic volume<br>5: Limited Access Highway / High traffic volume | <b>B. Degree of Visible Change to Existing Conditions</b><br>0: No visible change to the transmission corridor or transmission structures<br>1: Minor change with minimal vegetation clearing, or only conductors change<br>2: Minor change: a new or replacement structure within existing cleared corridor<br>3: Moderate change: one existing 115 kV line and a new HVDC/345kV, or existing corridor widened by 75-150'<br>4: Significant change: new HVDC structures within existing clearing/clear cut<br>5: Significant change: new 150' wide cleared corridor, new HVDC structures | <b>C. Length of Exposure Following Upgrade</b><br>1: Transmission corridor visible for < 3 seconds<br>3: Transmission corridor visible for 3 - 8 seconds<br>5: Transmission corridor visible for > 8 seconds | <b>D. Existing Screening Vegetation to be Removed</b><br>0: No vegetation would be lost by proposed activity<br>1: Minor shrubby/woody vegetation would be removed<br>2: Scattered clumps of trees/large shrubs which now screen the ROW would be lost<br>3: Active timber harvesting area/regenerating forest cover<br>4: Removal of 75' of vegetation that screens the existing cleared corridor<br>5: Significant loss of effective screening vegetation | <b>E. Corridor Alignment</b><br>0: Abrupt change in alignment or topography within one structure or within 1/4 mile<br>3: Significant change in alignment or topography within 1/4 to one mile<br>5: No visible change in corridor alignment (straight line alignment) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

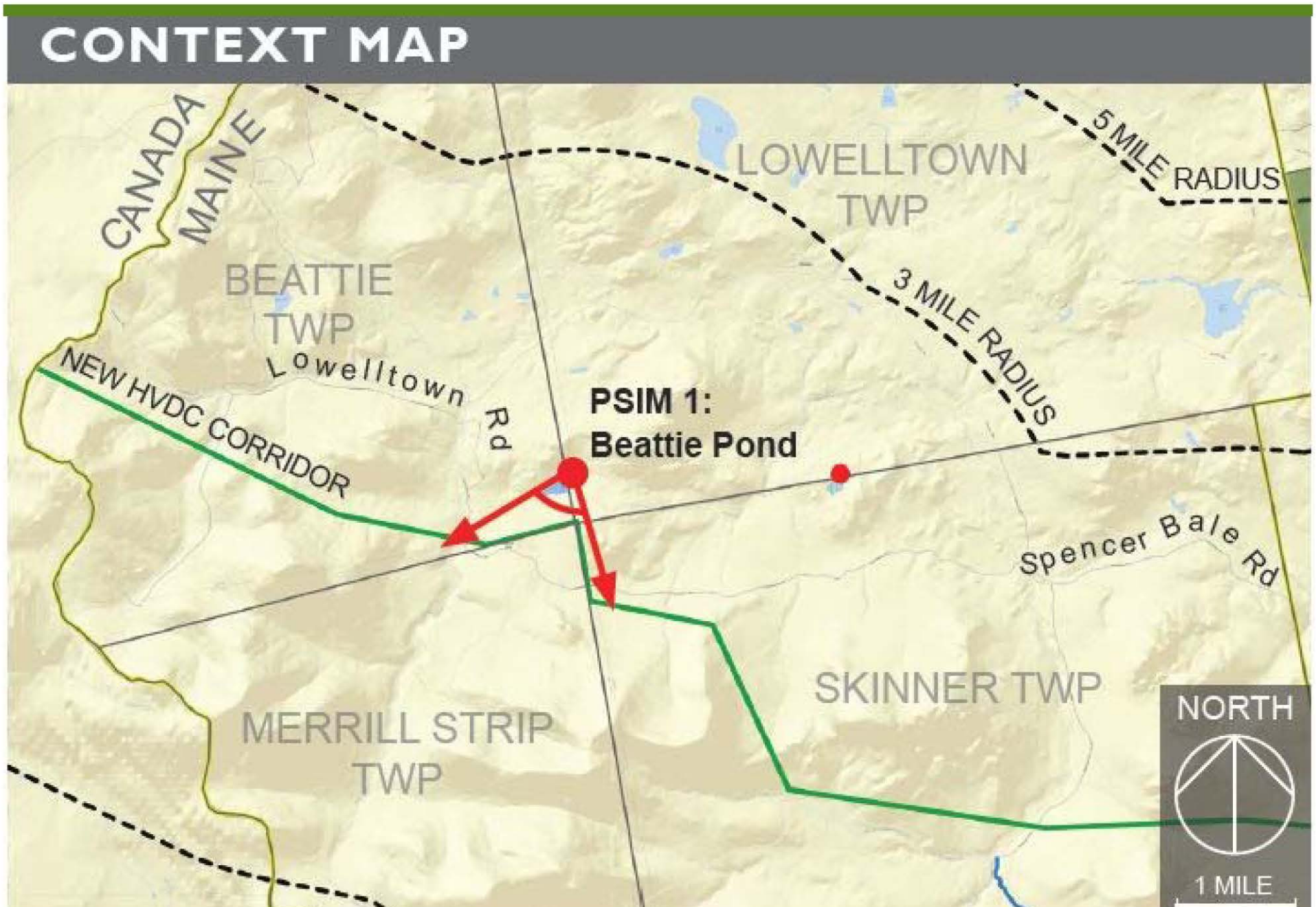
2018.10.19





# Beattie Pond - Lowelltown twp

5097





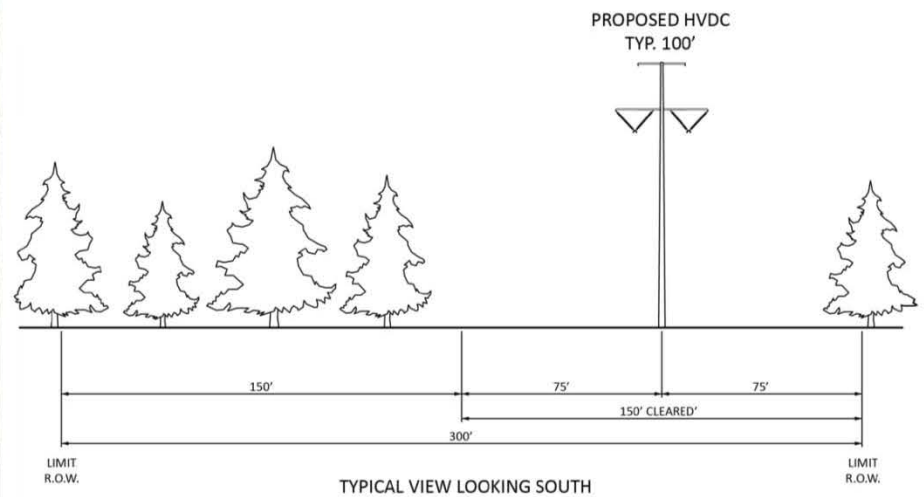
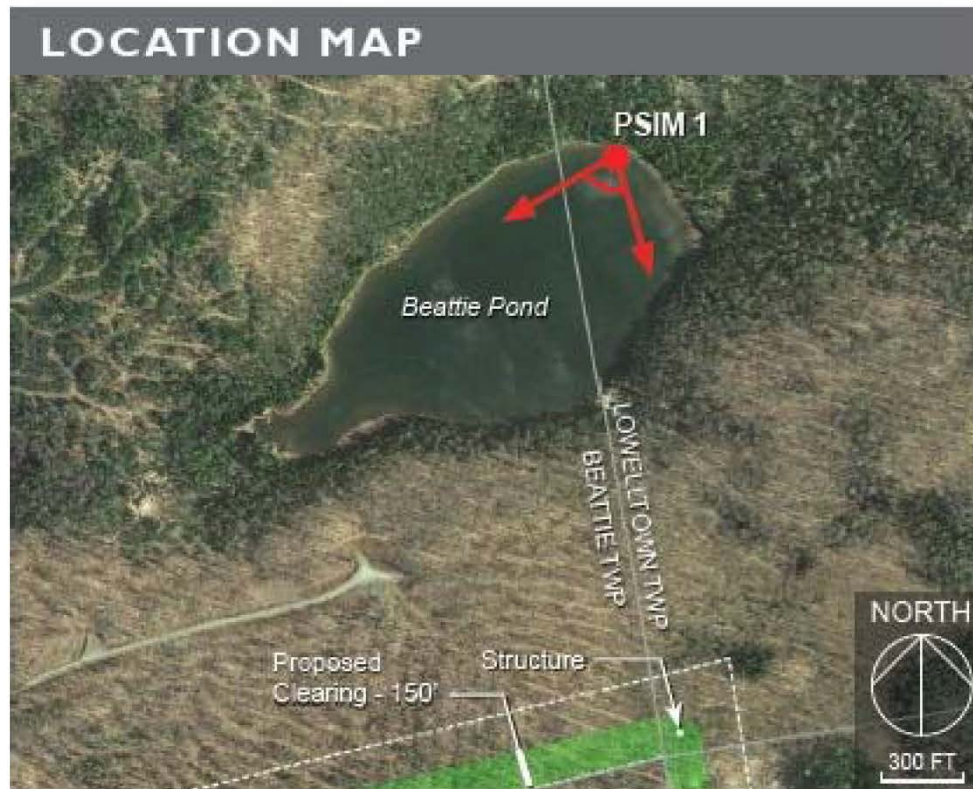
# Beattie Pond - LUPC Zoning - P-RR Subdistrict





# Beattie Pond - Lowelltown Twp

5099



# Beattie Pond - Lowelltown Twp

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5100





# Beattie Pond - Existing Conditions





# Beattie Pond - Photosimulation - <sup>5102</sup>September 2017





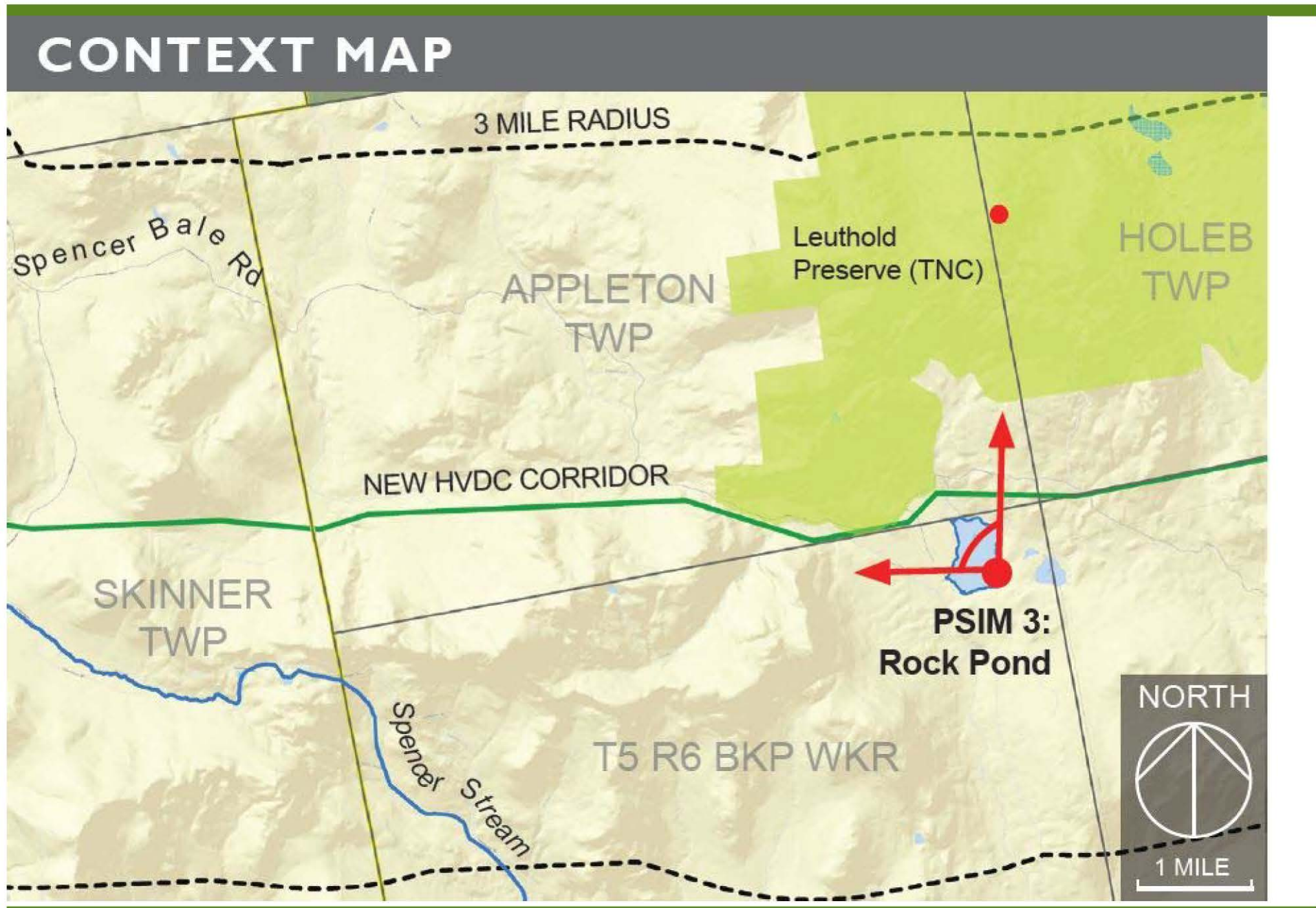
# Beattie Pond - Photosimulation - Re-Engineered January 2019





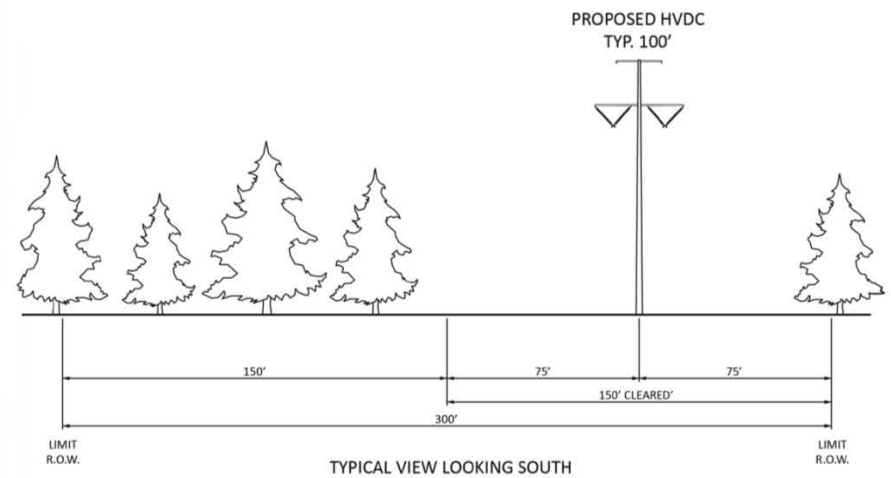
# Rock Pond - T5 R6 BKP WKR

5104



# Rock Pond - T5 R6 BKP WKR

5105







## Rock Pond - Existing Conditions - looking Northwest





# Rock Pond - Photosimulation - Full Height Vegetation/Gold Brook

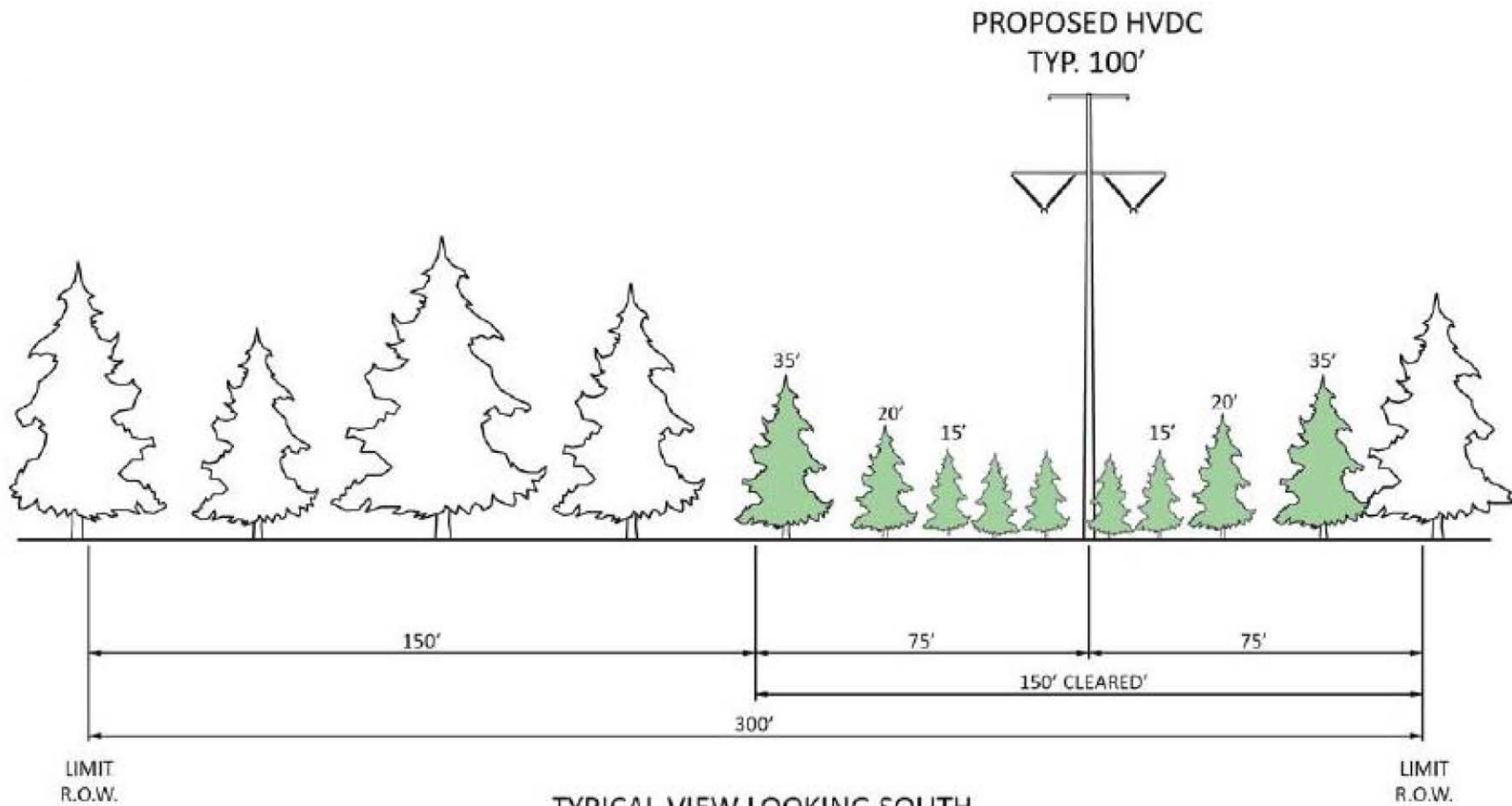




# Rock Pond - Photosimulation - Tapered Vegetation Management



# Cross Section of Tapered Vegetation Management





## Rock Pond - Existing Conditions - looking North<sup>5111</sup>



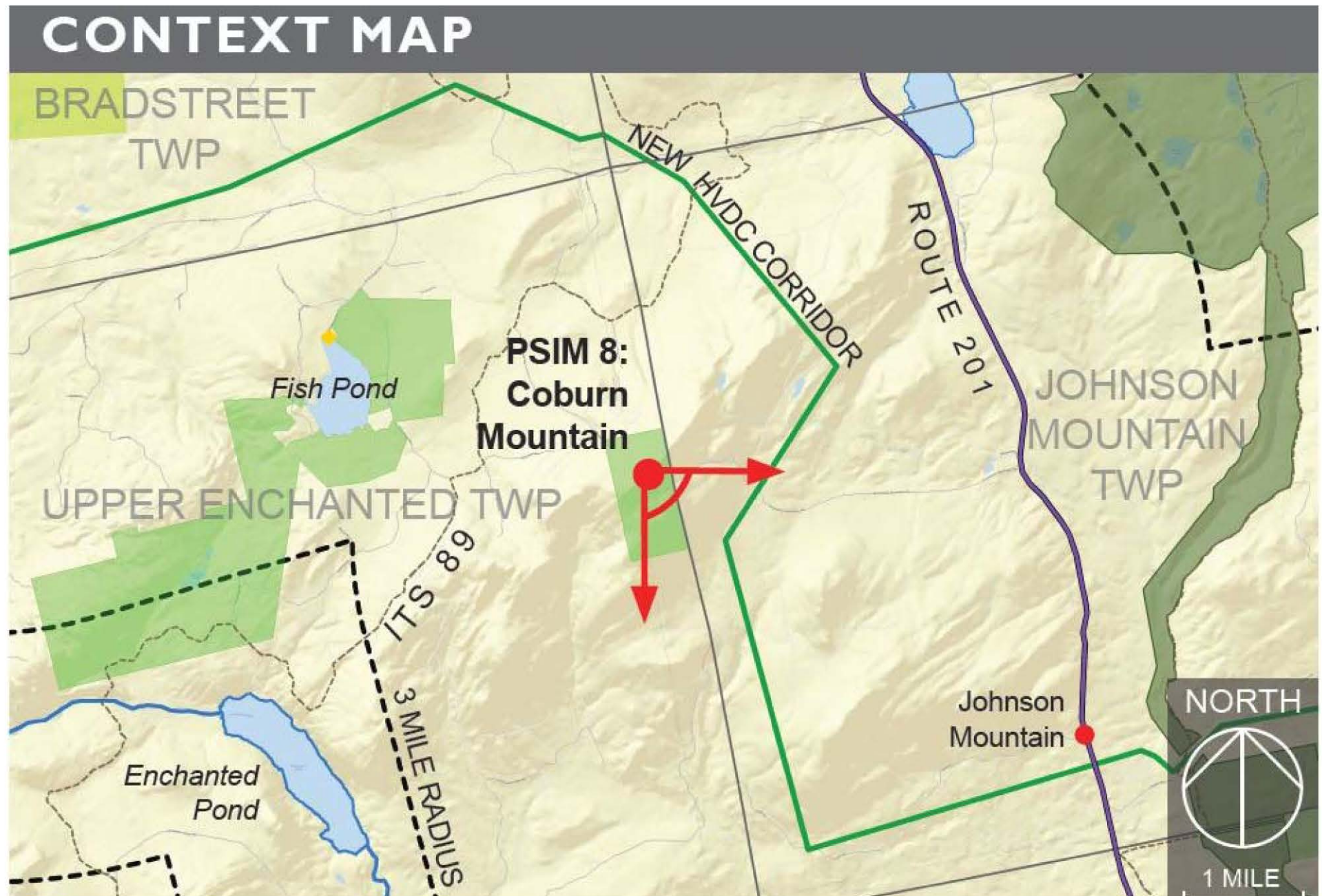


# Rock Pond - Photosimulation with Non-Specular Conductors



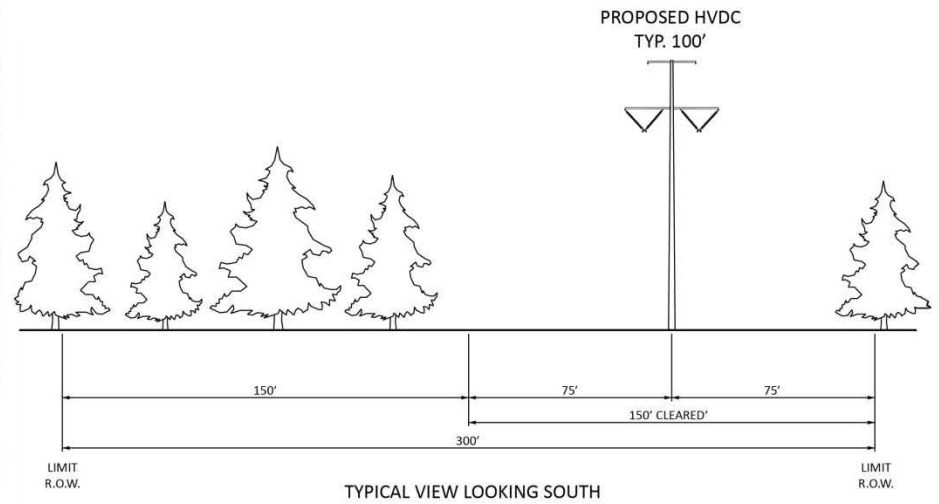
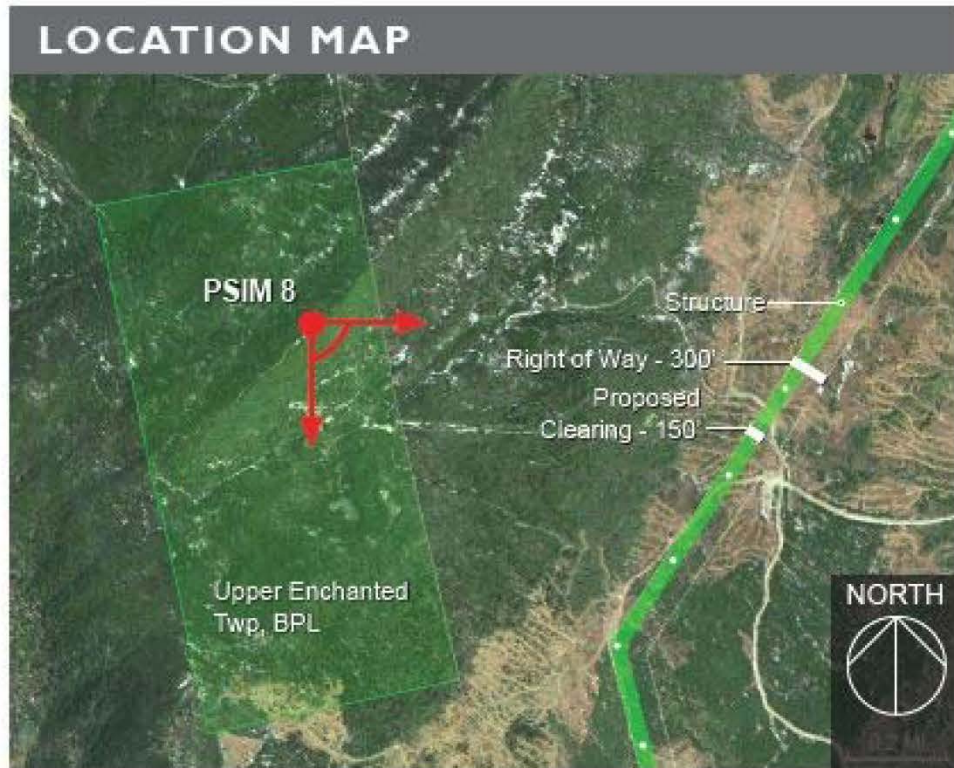


# Coburn Mountain - Upper Enchanted Twp.

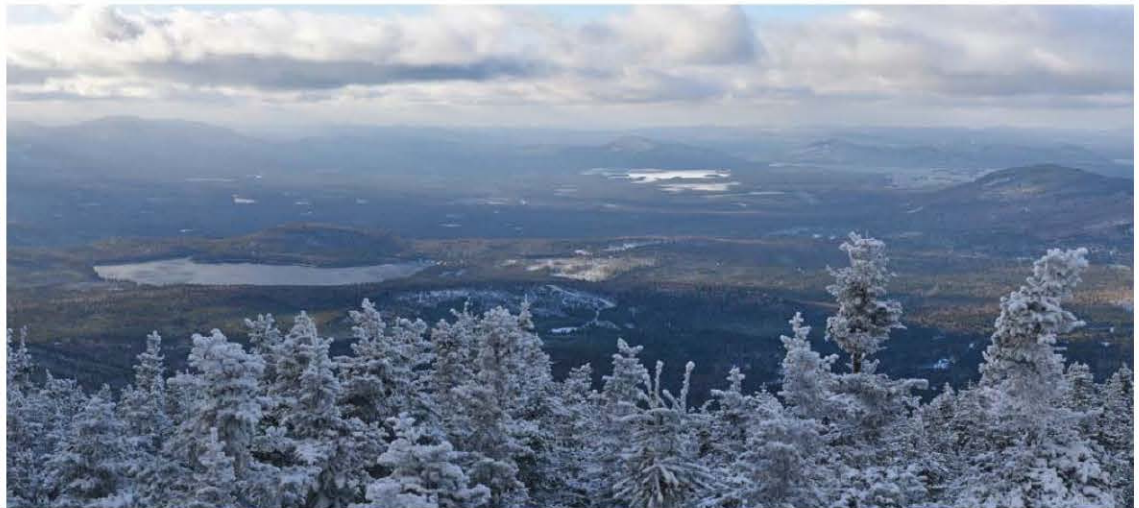




# Coburn Mountain - Upper Enchanted Twp.

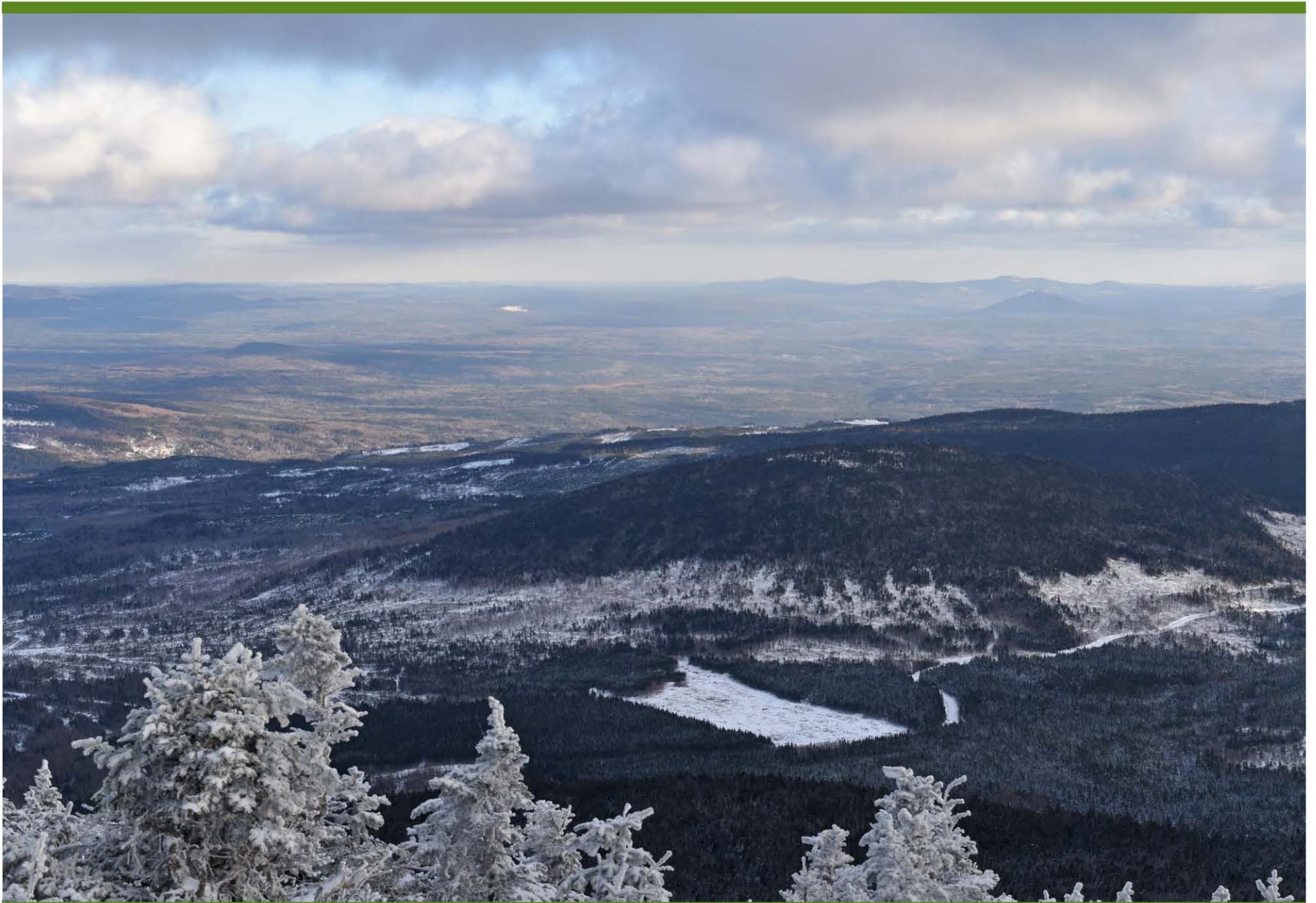


# Coburn Mountain - BPL Parcel in <sup>5115</sup>Upper Enchanted Twp



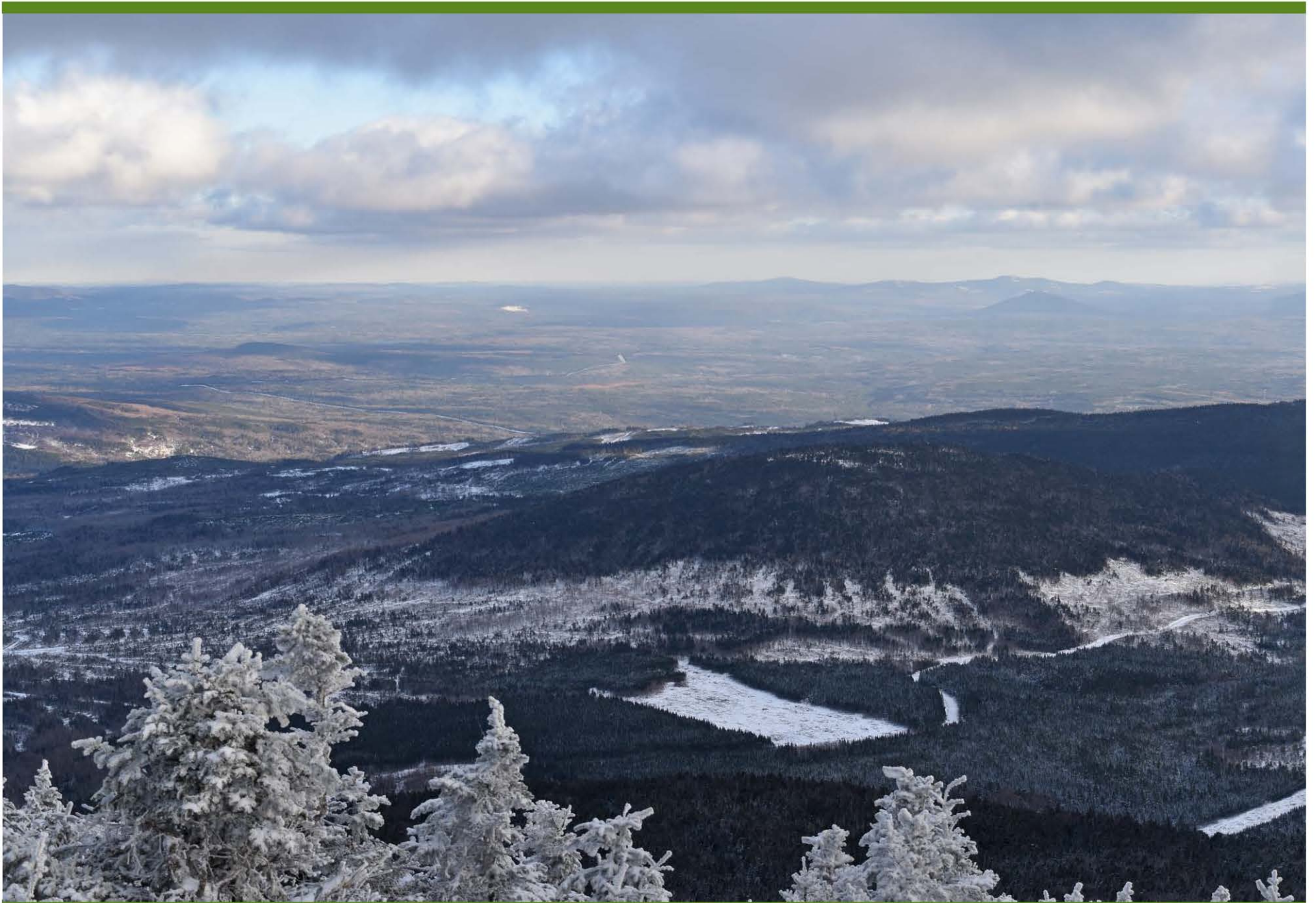


# Coburn Mountain - Existing Conditions - looking East



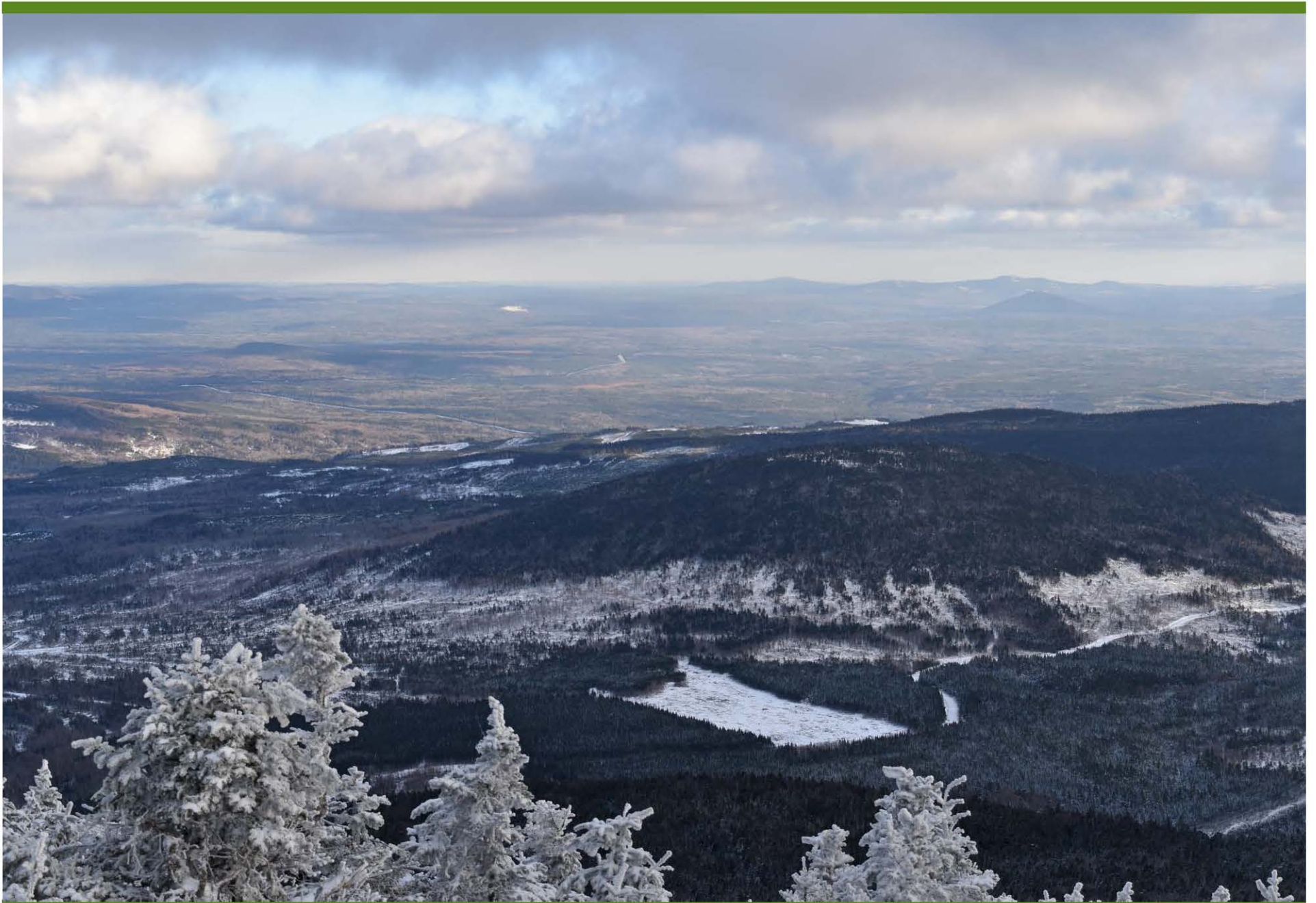


# Coburn Mountain - Photosimulation



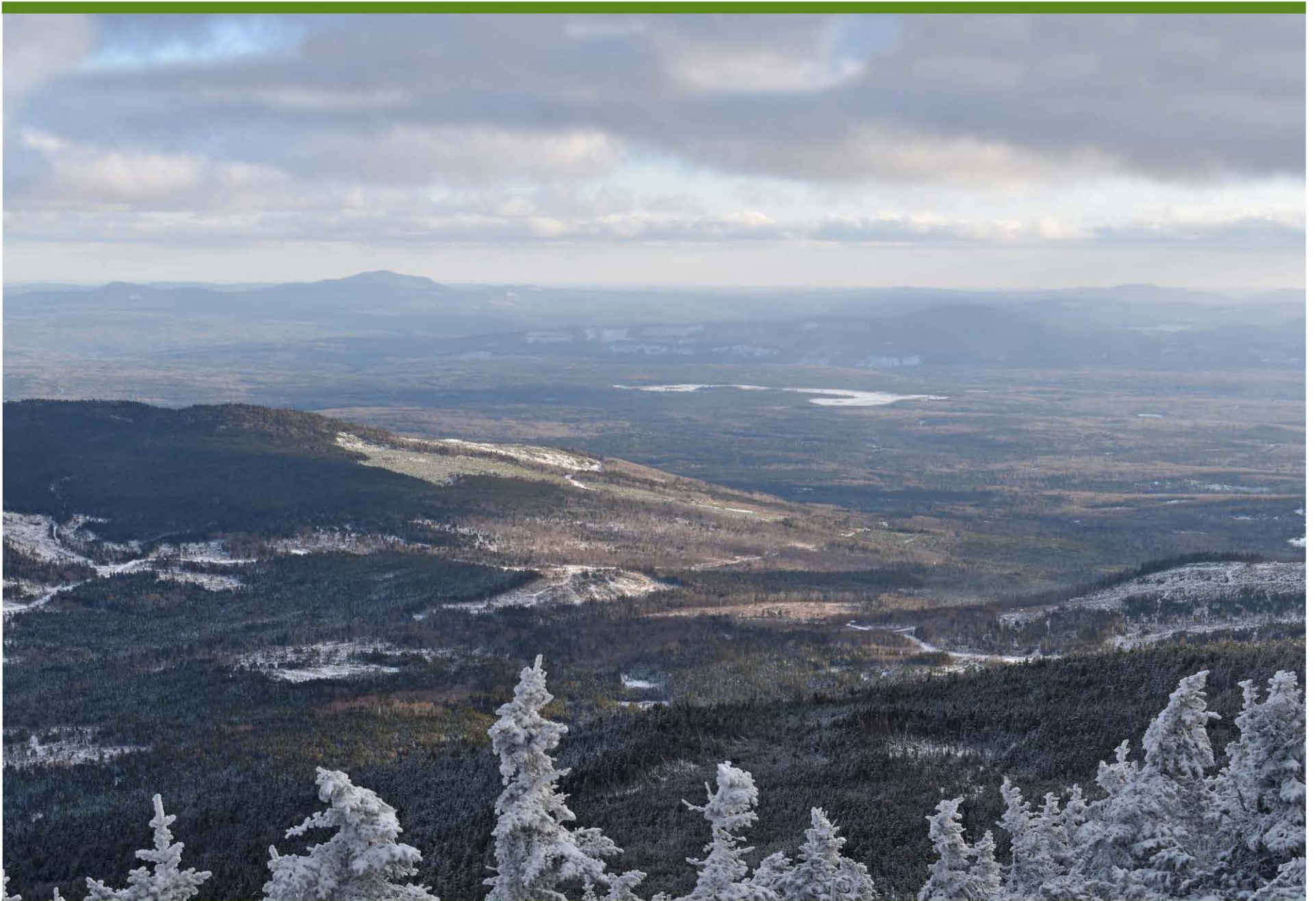


# Coburn Mountain - Photosimulation - Tapered Vegetation Management



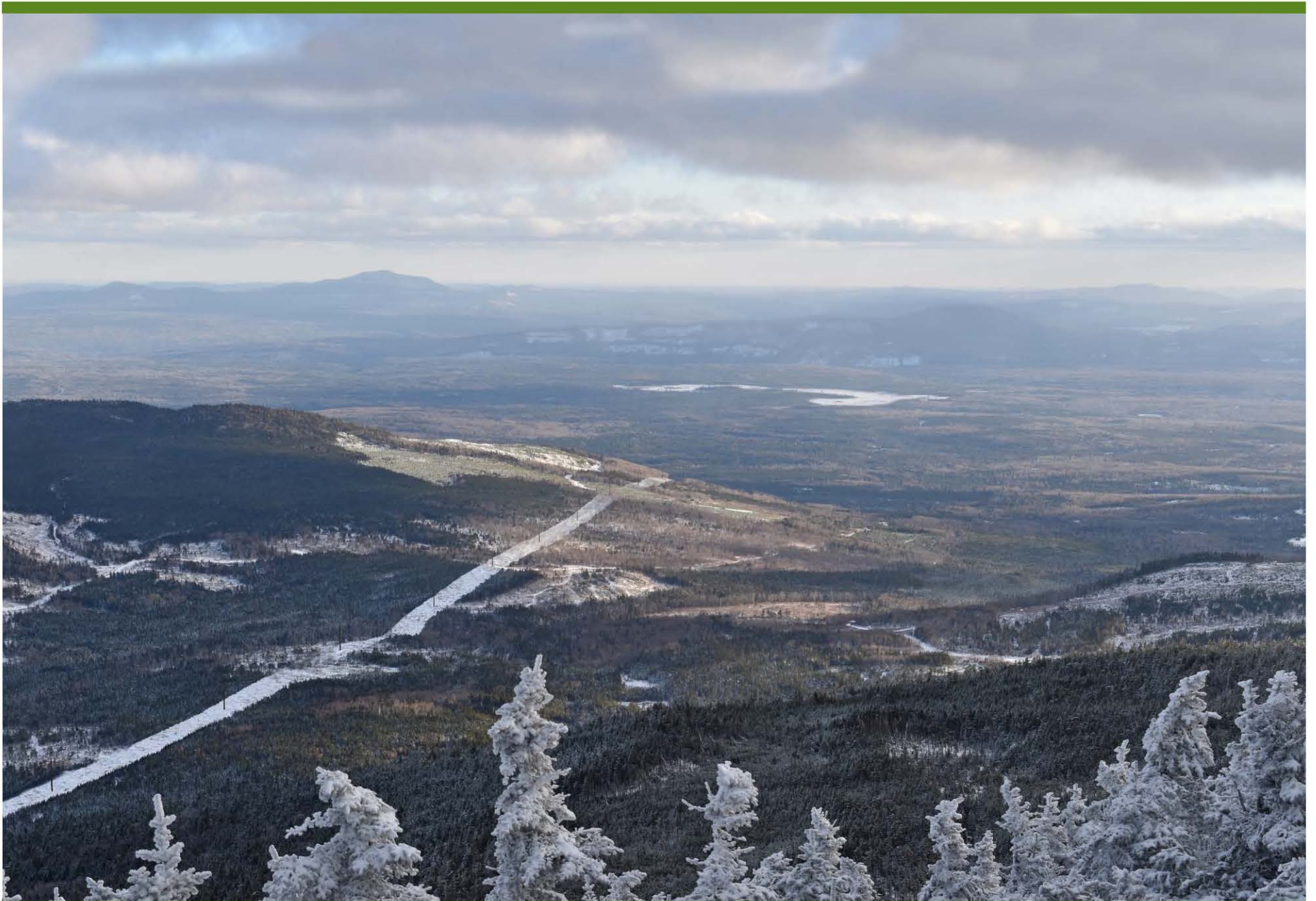


# Coburn Mountain - Existing Conditions



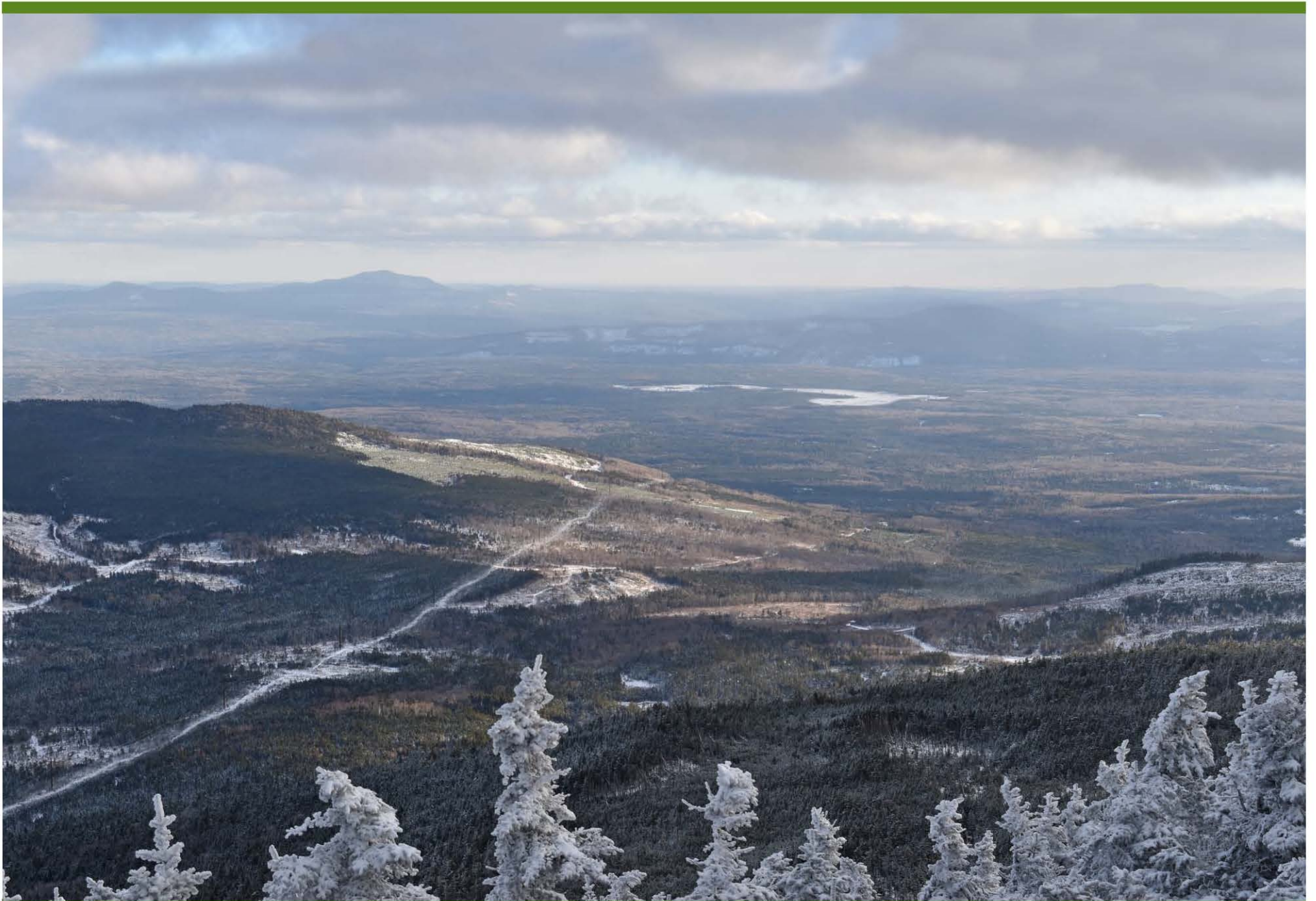


# Coburn Mountain - Photosimulation

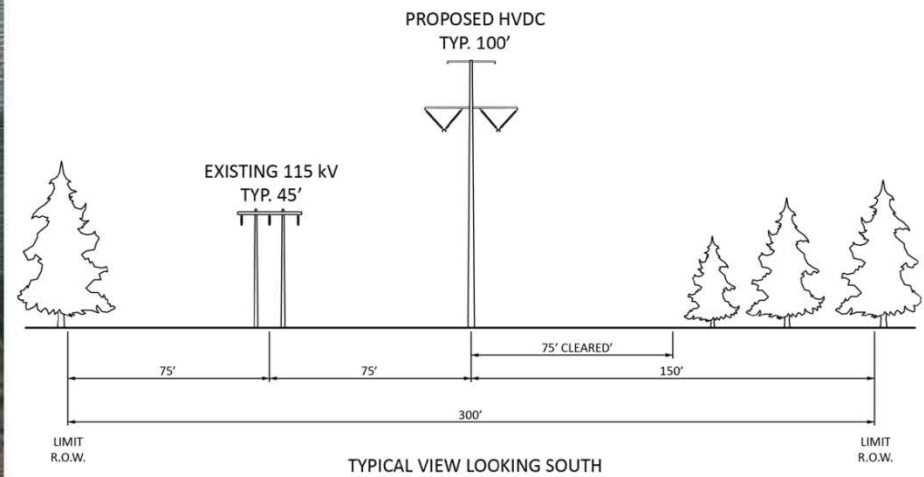




# Coburn Mountain - Photosimulation - Tapered Vegetation Management



# Moxie Pond - Bald Mtn Twp T2 R3<sup>5122</sup>





# Moxie Pond - Existing Conditions - southern end looking West





# Moxie Pond - Photosimulation - <sup>5124</sup>September 2017



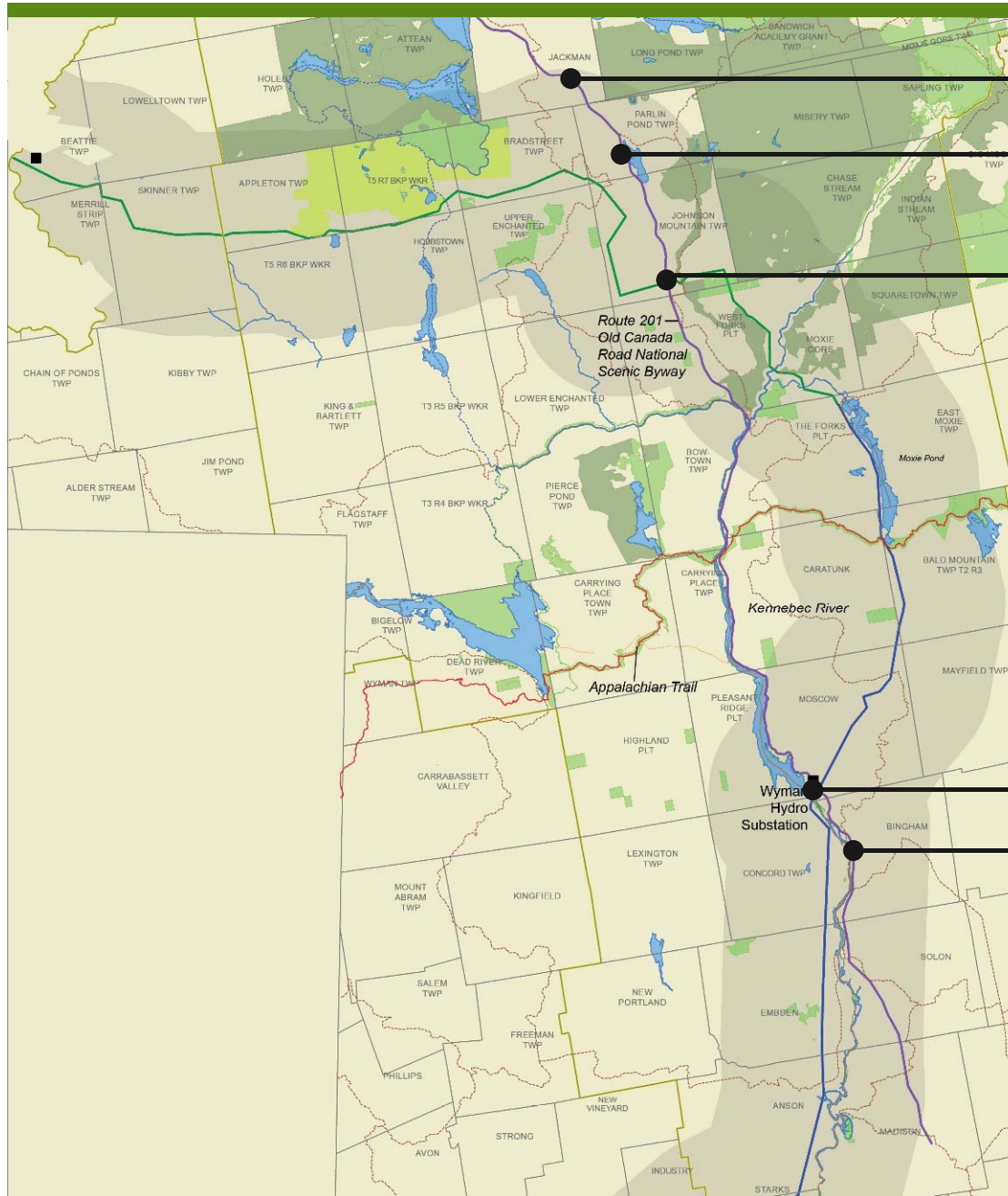


# Moxie Pond - Photosimulation of Re-Engineered December 2017





## Route 201 - Old Canada Road National Scenic Byway



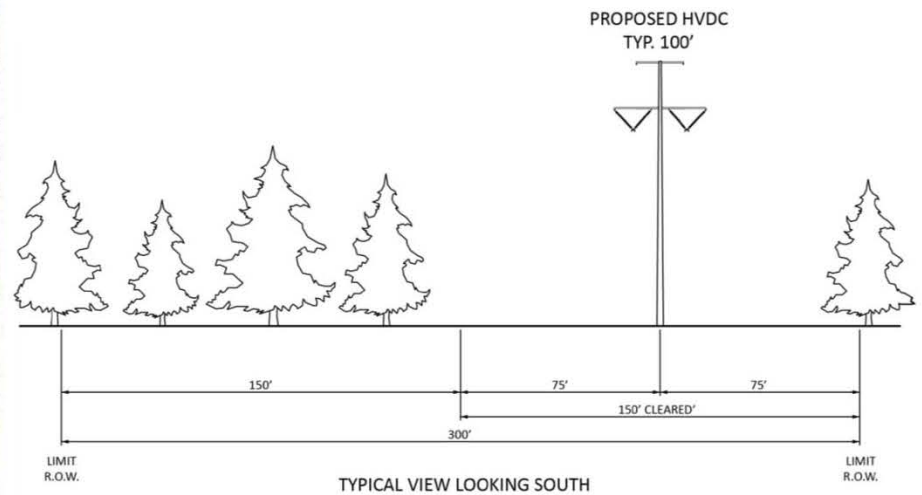
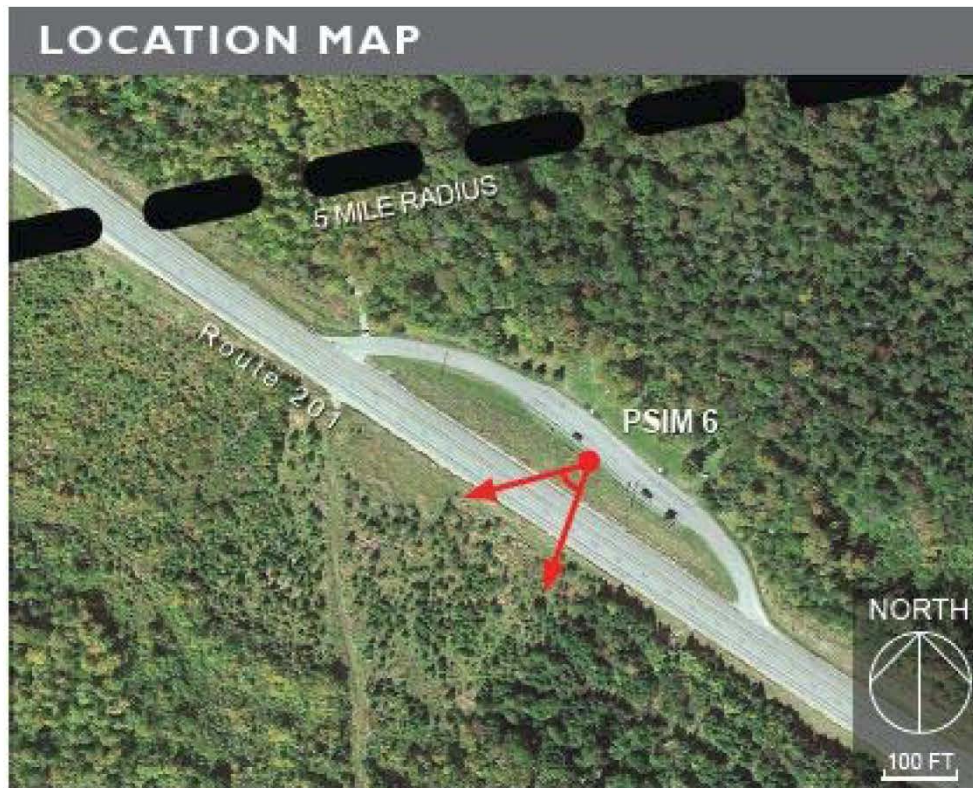
**Attean View Rest Area**

**Parlin Pond Twp**

**Johnson Mountain  
Twp crossing**

**Moscow crossing  
Bingham**

# Route 201 - Attean View Rest Area, Jackman





## Route 201 - Attean View Rest Area, Jackman





## Route 201 - Attean View Rest Area – Existing Conditions



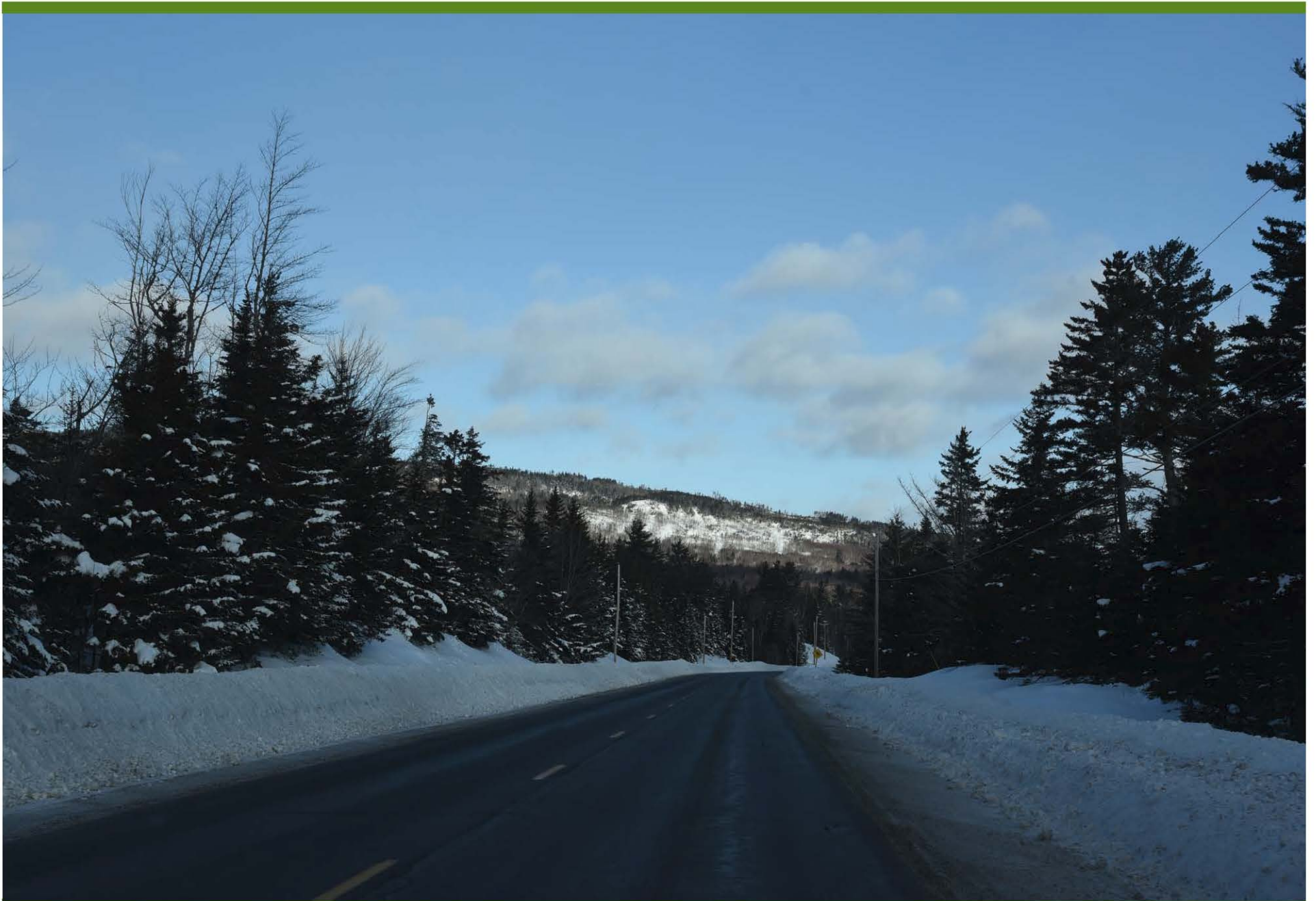


## Route 201 - Attean View Rest Area – Photosimulation





## Route 201 – views of commercial forestland





## Route 201 – views of commercial forestland

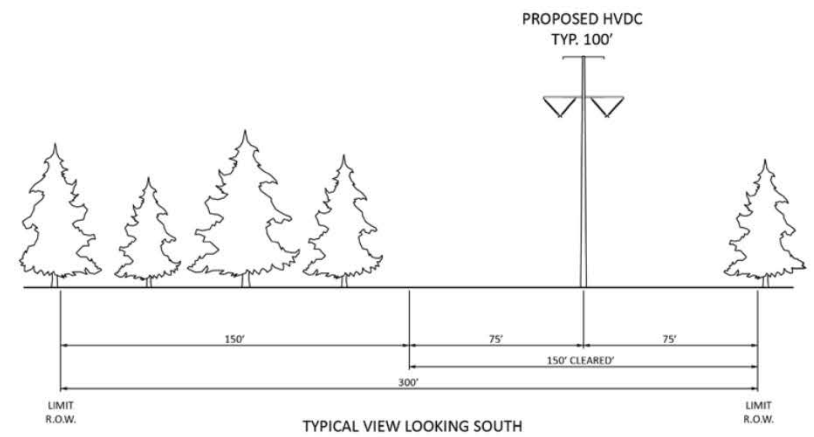
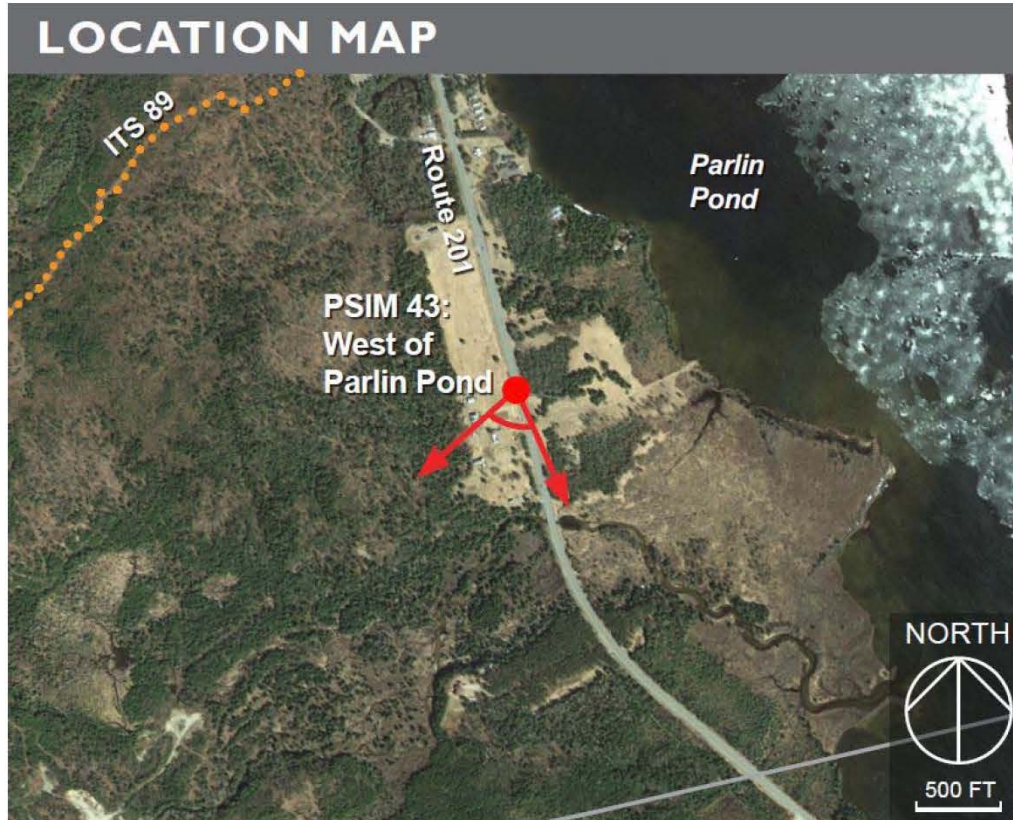


## Route 201 – snowmobile trail adjacent to road





## Route 201 – Parlin Pond Twp



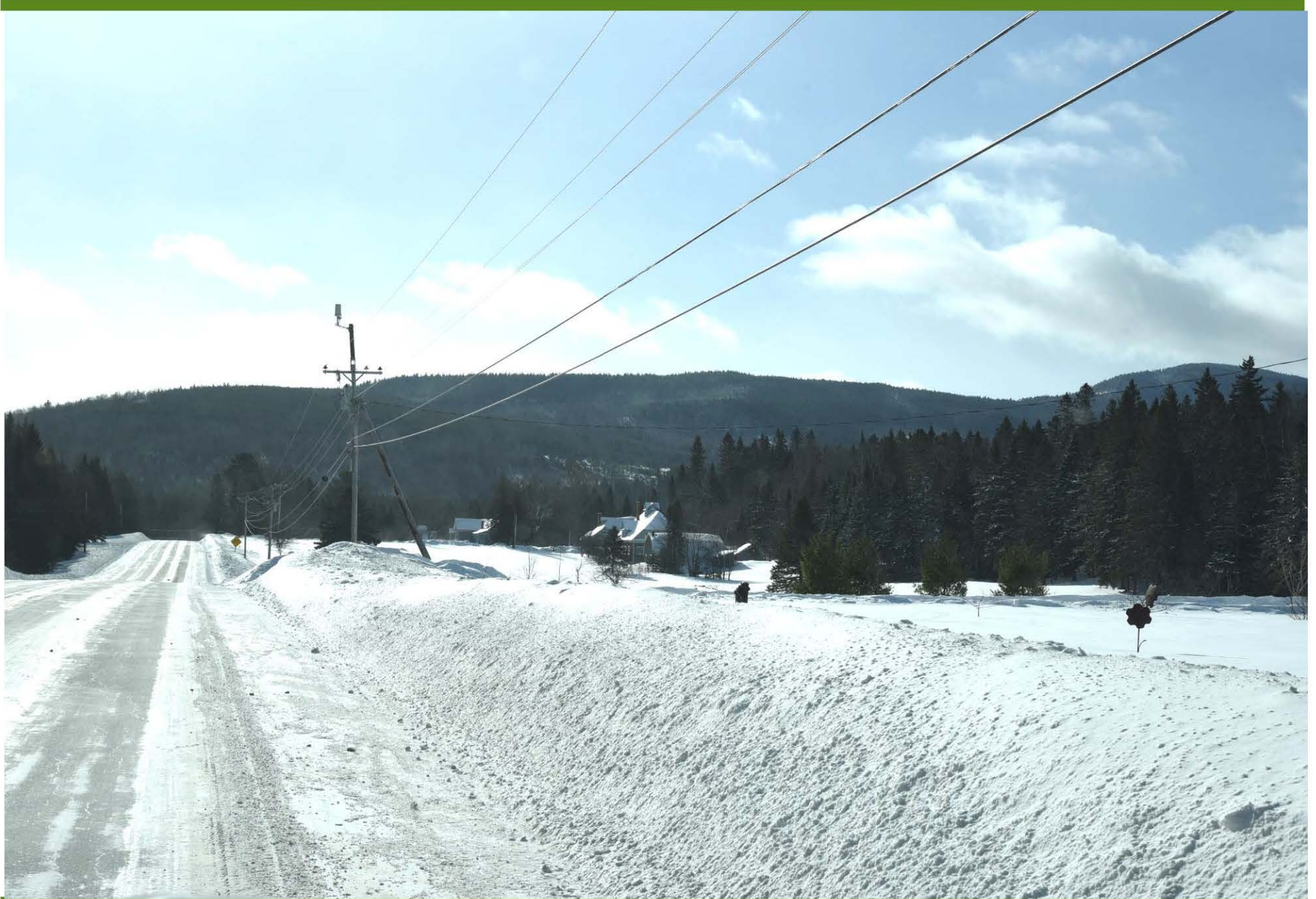


## Route 201 – traveling south in Parlin Pond Twp





## Route 201 – traveling south in Parlin Pond Twp



## Route 201 – traveling south in Parlin Pond Twp





## Route 201 – traveling south in Parlin Pond Twp



## Route 201 – traveling south in Parlin Pond Twp





## Route 201 – traveling south in Parlin Pond Twp





## Route 201 – traveling south in Parlin Pond Twp





## Route 201 – traveling south in Parlin Pond Twp





## Route 201 - Parlin Pond Twp – Existing Conditions



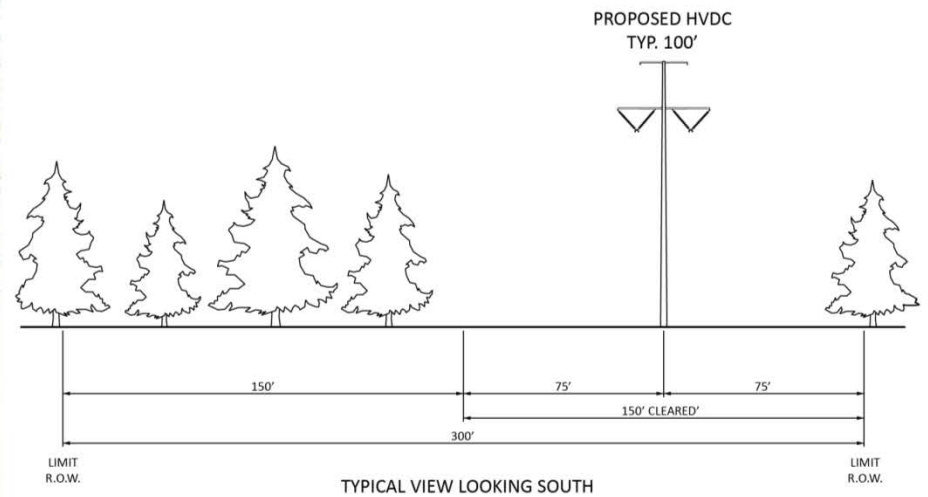
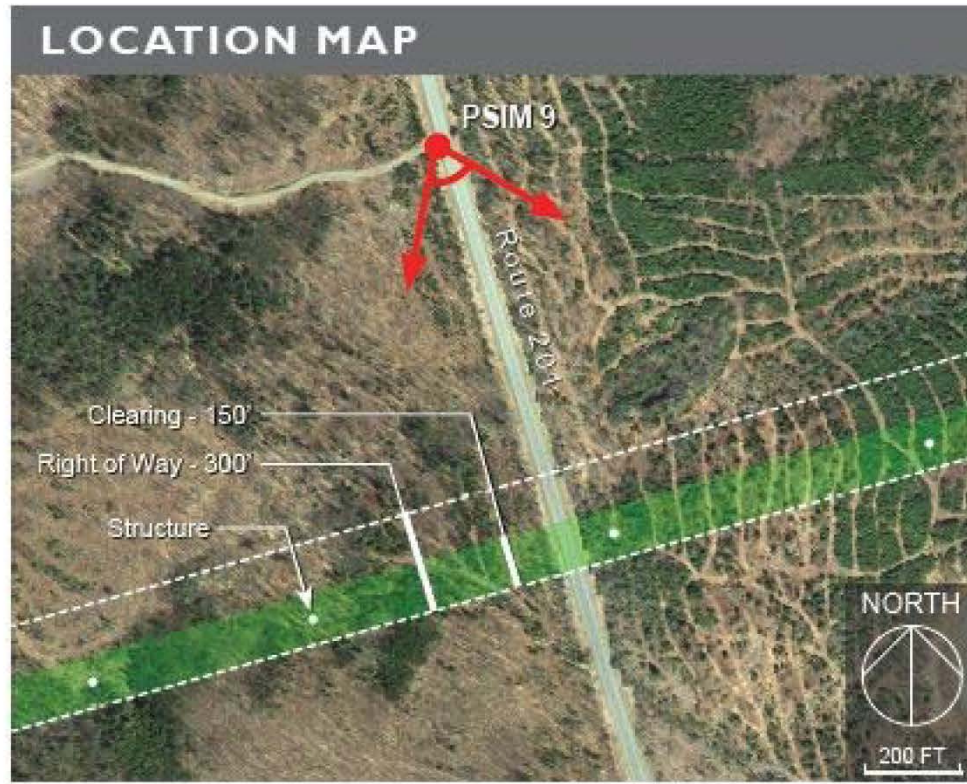


## Route 201 - Parlin Pond Twp – Photosimulation





## Route 201 - Johnson Mountain Twp



## Route 201 - Johnson Mountain Twp – Existing Conditions





## Route 201 - Johnson Mountain Twp – Photosimulation

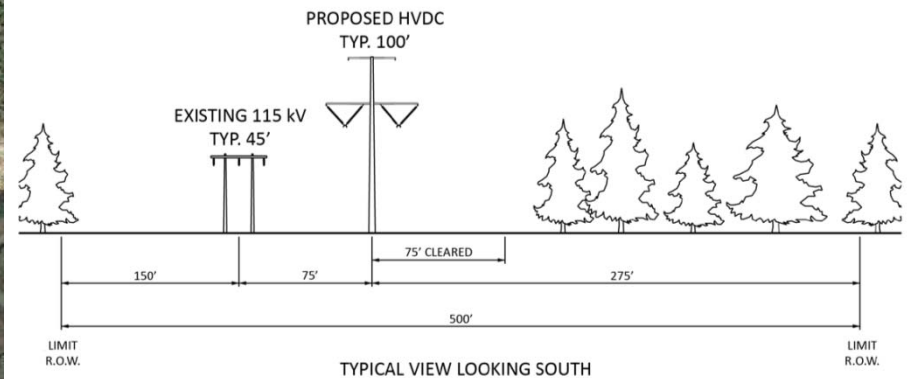
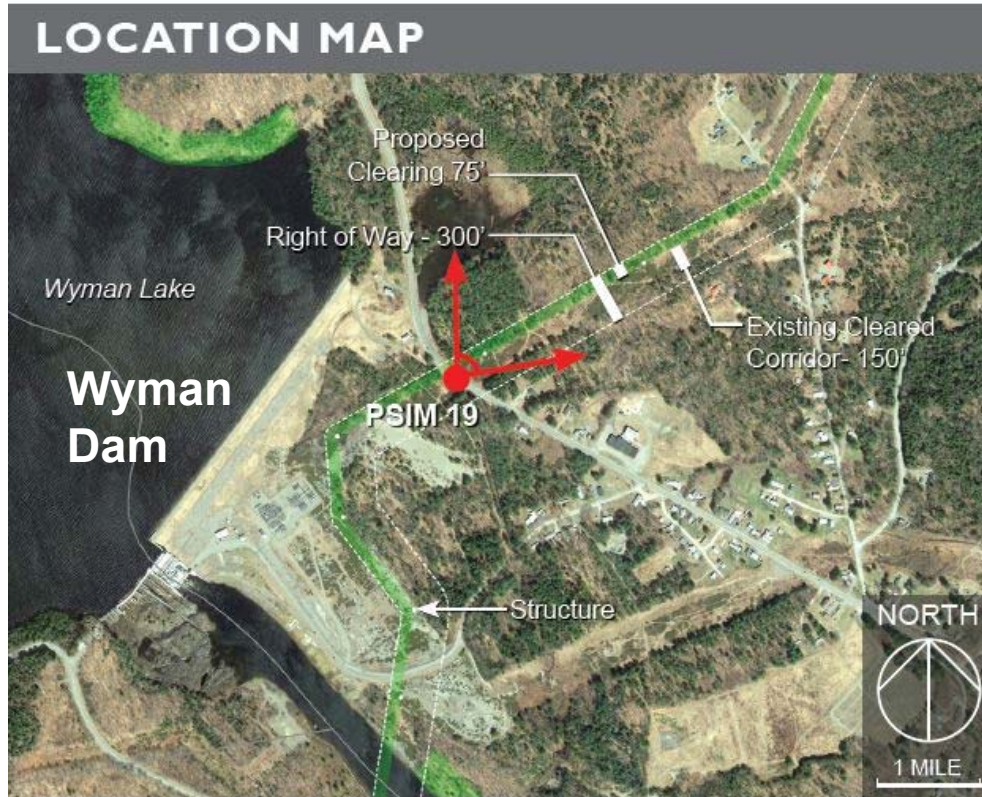


## Route 201 – Jackman Tieline





## Route 201 - Moscow





## Route 201 - Moscow – Existing Conditions





## Route 201 - Moscow – Photosimulation





## Route 201 - Moscow – Existing Conditions





## Route 201 - Moscow – Photosimulation





## Route 201 - Bingham





## Route 201 - Bingham





## Route 201 - Bingham Village Cemetery

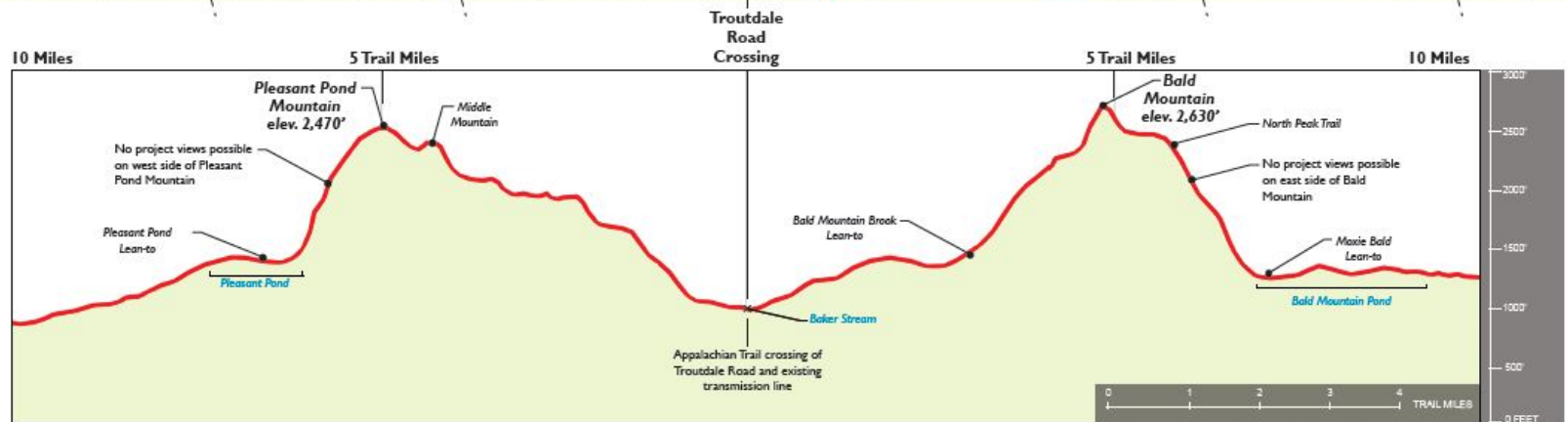
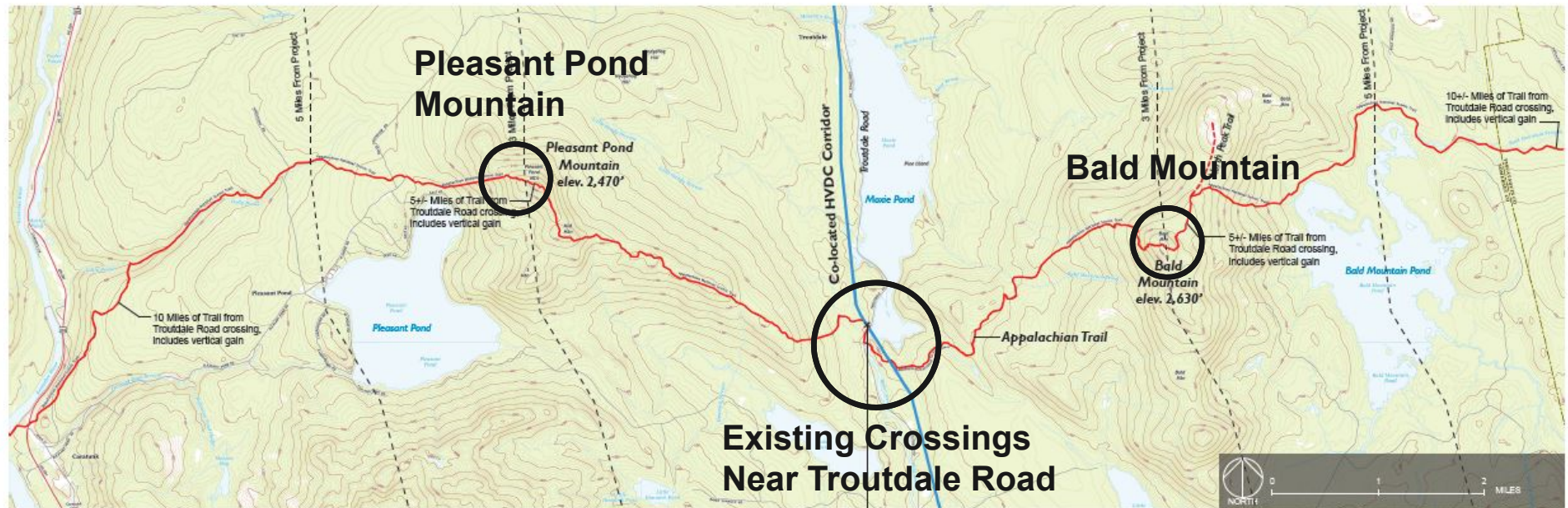




# Appalachian Trail – Map

## Appendix E: Appalachian Trail

### Trail Map and Cross Section



10 Mile Appalachian Trail Section

September 27, 2017

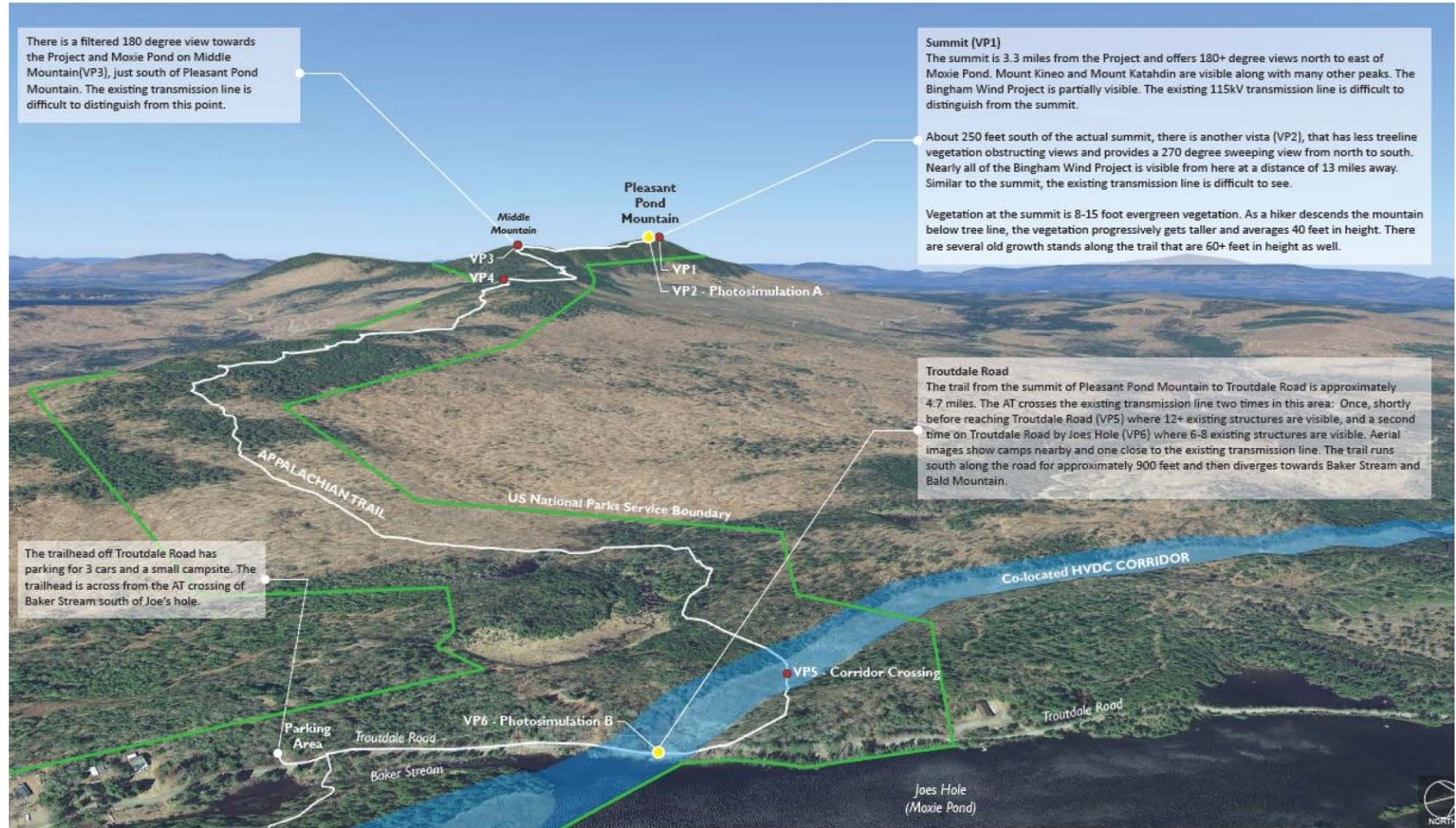
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# Appalachian Trail – Aerial Map

Appendix E: Appalachian Trail

Google Earth Aerial - Troutdale Road to Pleasant Mountain





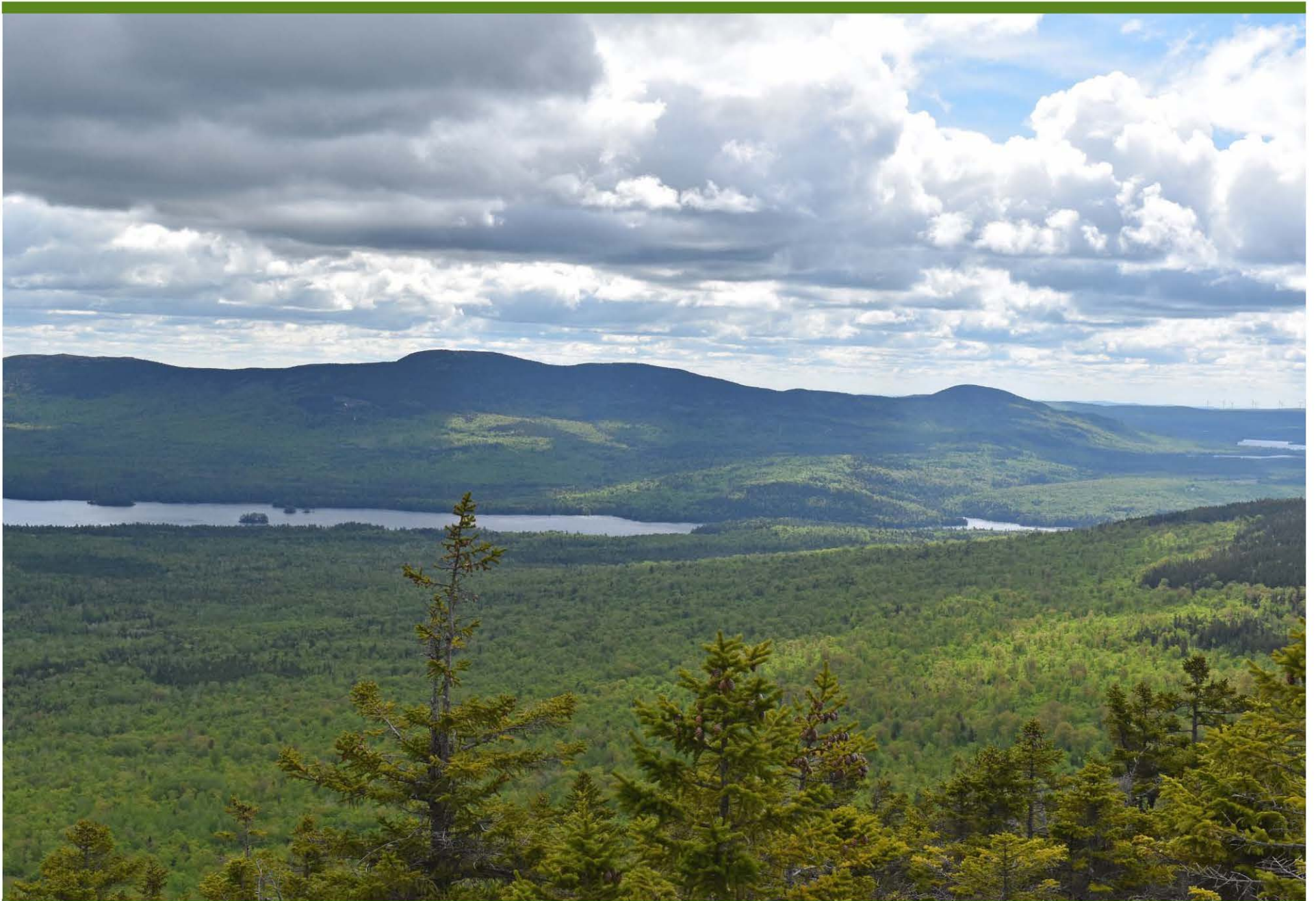
## Appalachian Trail – Pleasant Pond Mountain

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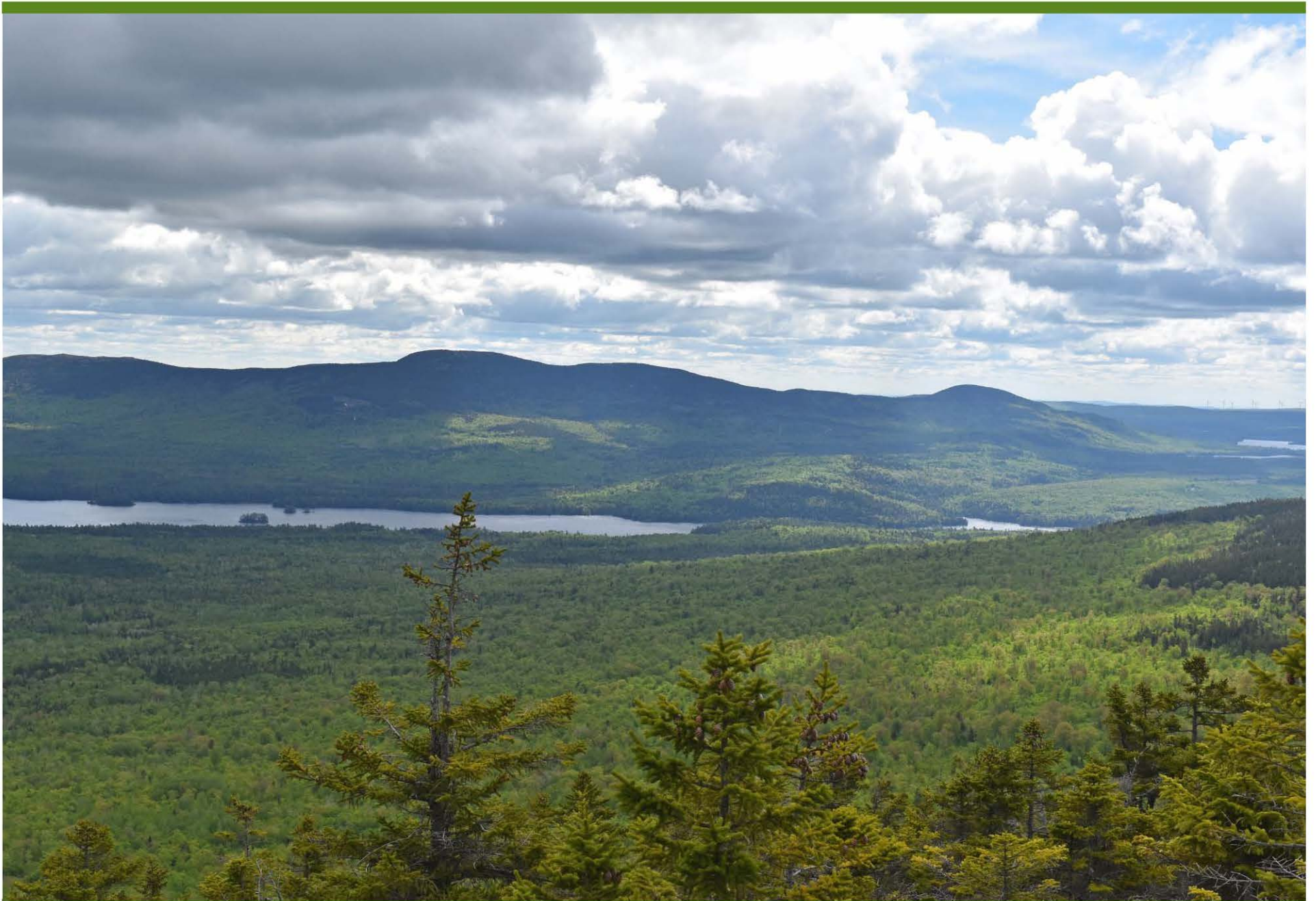


## Appalachian Trail – Pleasant Pond Mountain – Existing Conditions



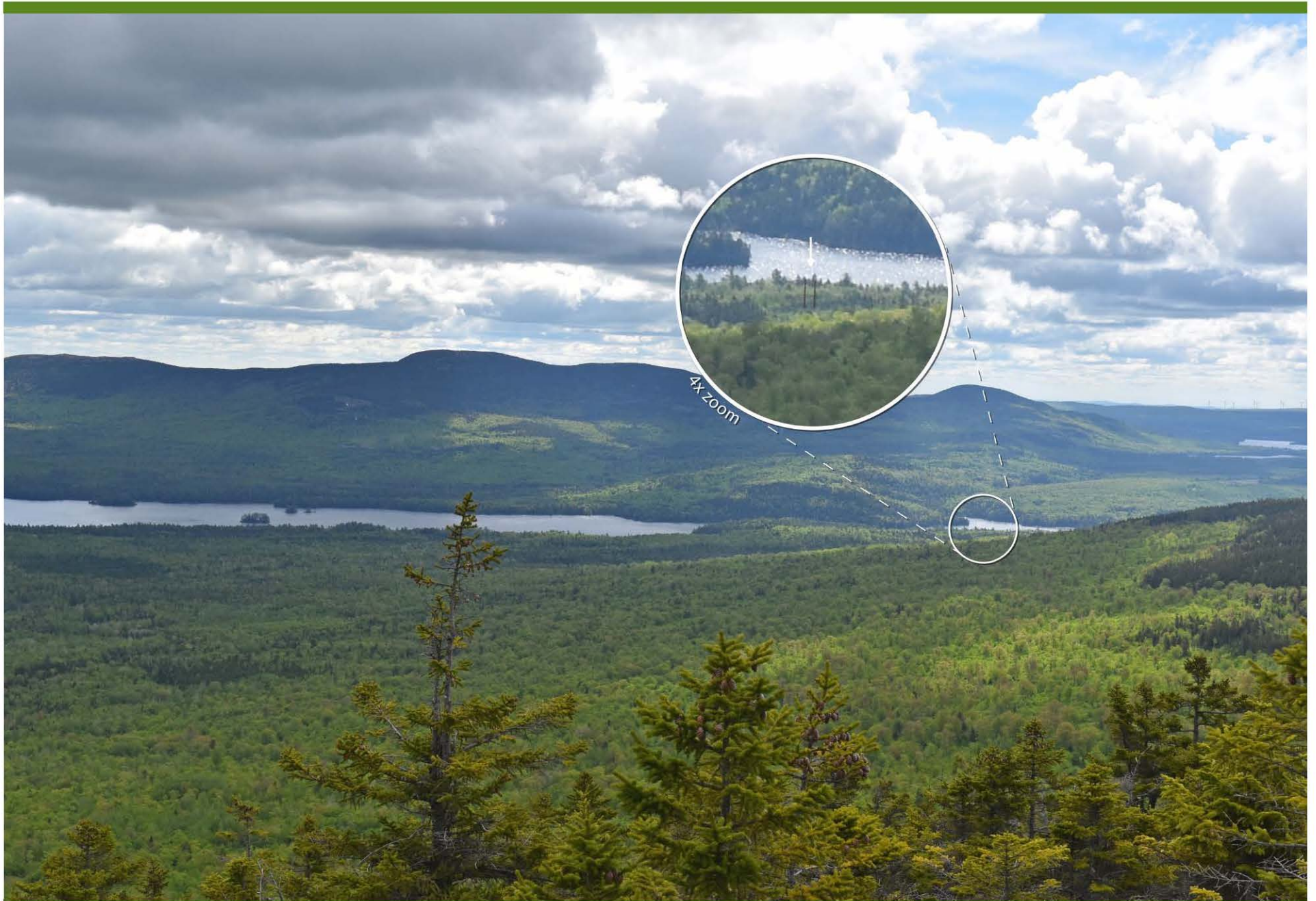


## Appalachian Trail – Pleasant Pond Mountain - Photosimulation





# Appalachian Trail – Pleasant Pond Mountain - Photosimulation





## Appalachian Trail – Existing crossing west of Troutdale Road





## Appalachian Trail – Existing crossing west of Troutdale Road





## Appalachian Trail – Existing crossing on Troutdale Road





## Appalachian Trail – Troutdale Road - Photosimulation





## Appalachian Trail – Existing crossing on Troutdale Road





## Appalachian Trail –Troutdale Road - Photosimulation





## Appalachian Trail –Troutdale Road - Photosimulation with plantings

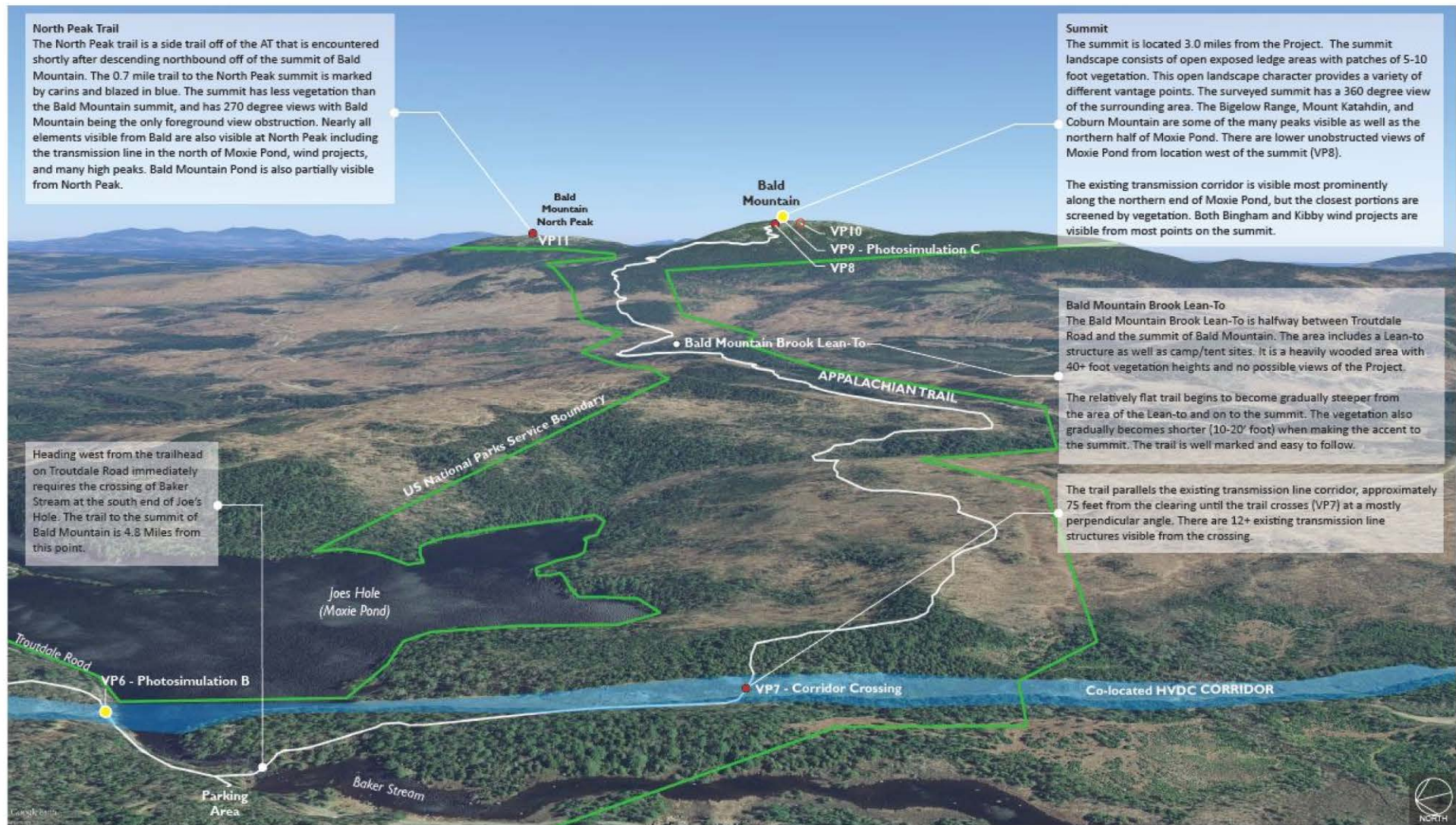




# Appalachian Trail – Aerial Map

## Appendix E: Appalachian Trail

### TROUTDALE ROAD TO BALD MOUNTAIN





## Appalachian Trail – Existing crossing East of Troutdale Road





## Appalachian Trail – Existing crossing East of Troutdale Road





## Appalachian Trail – Bald Mountain



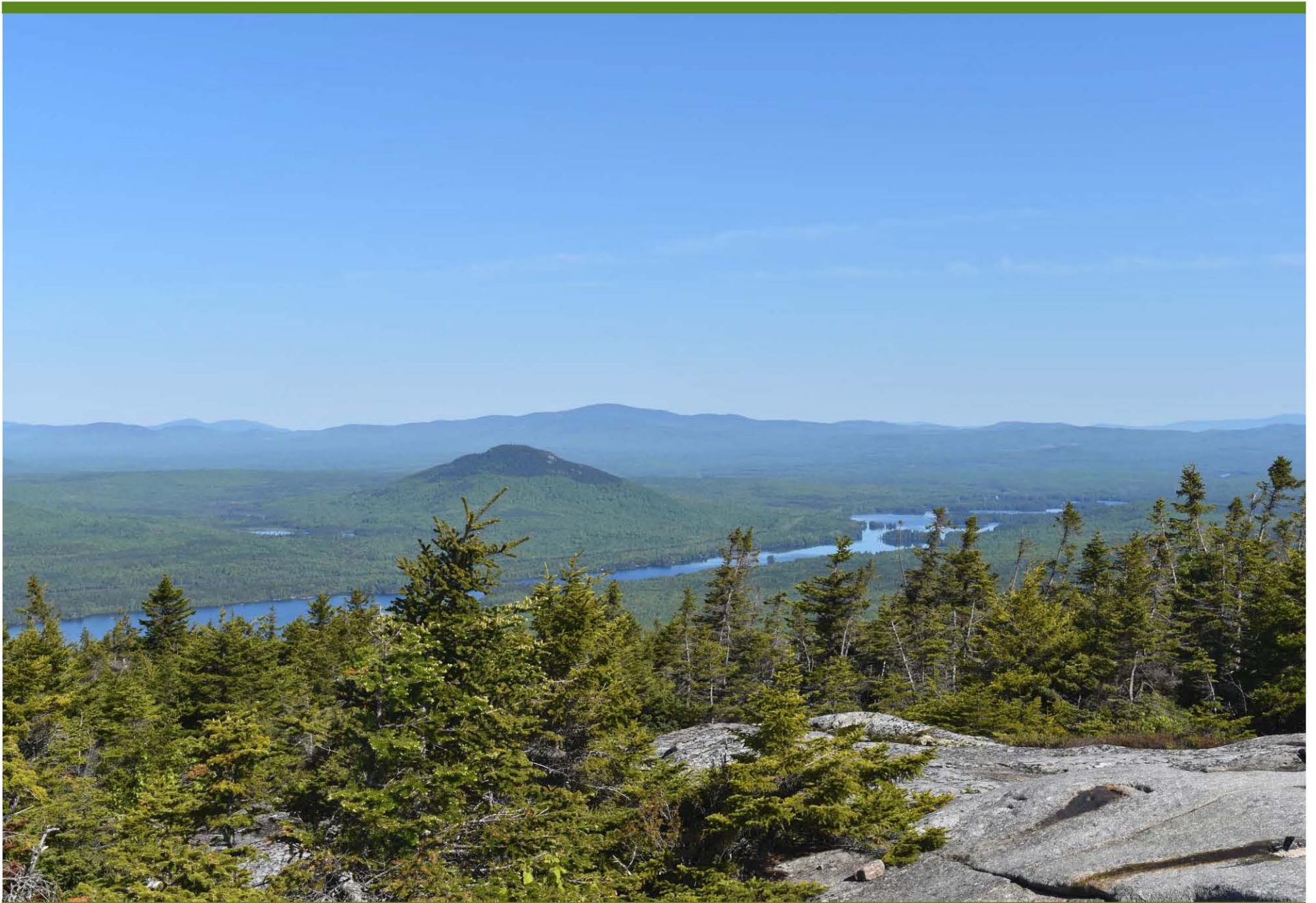


## Appalachian Trail – Bald Mountain – Existing Conditions



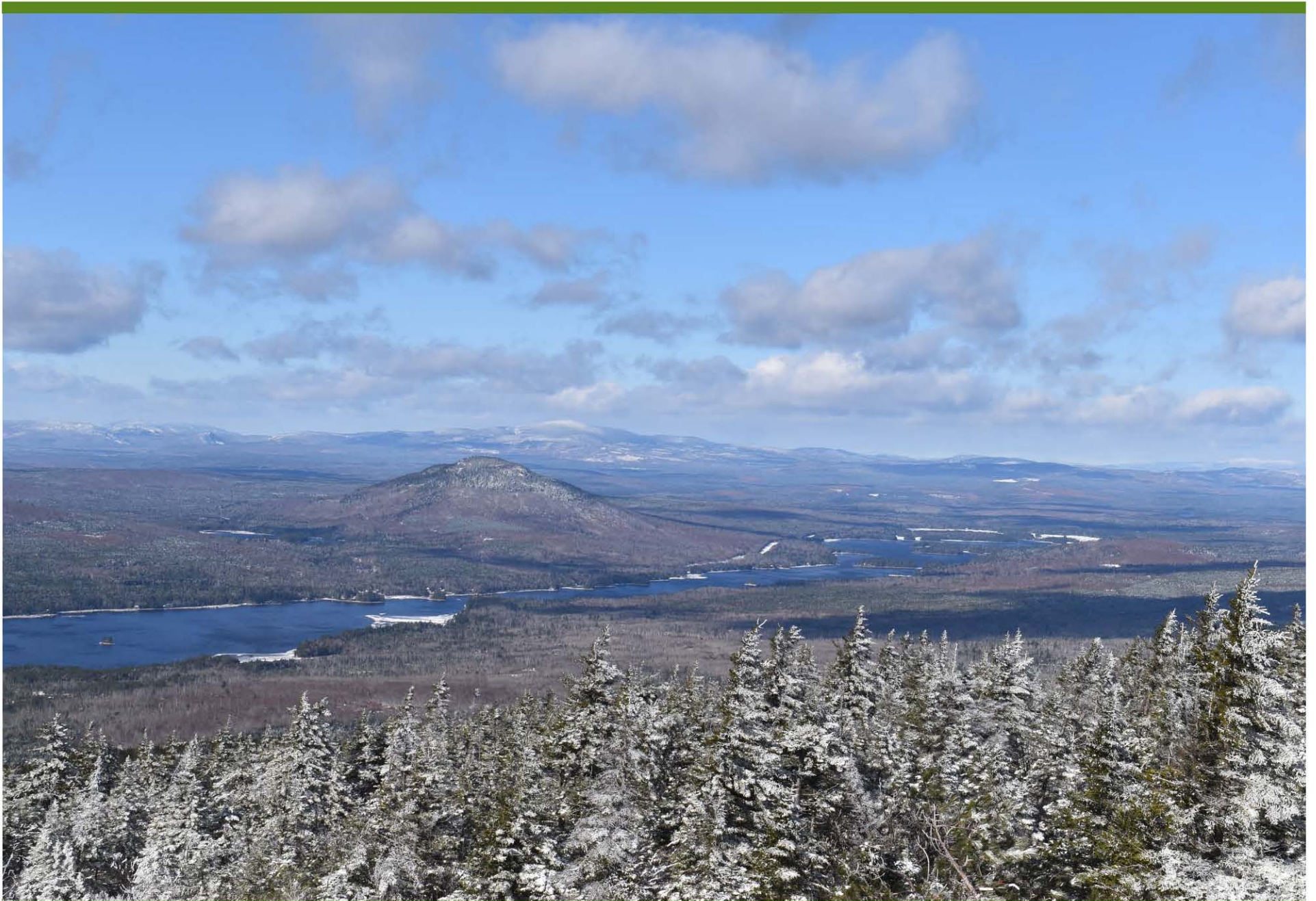


## Appalachian Trail – Bald Mountain - Photosimulation



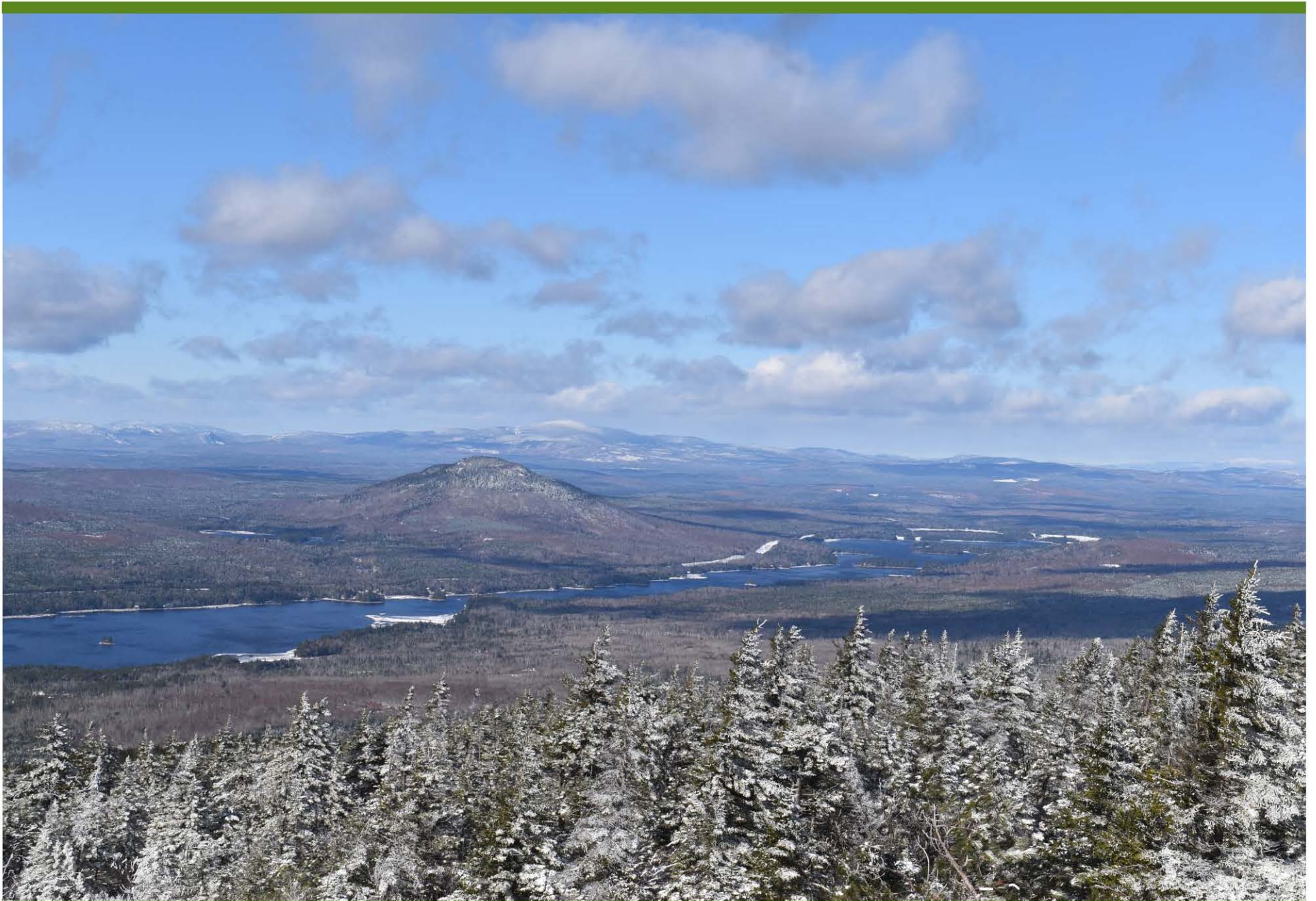


## Appalachian Trail – Bald Mountain – Existing Conditions



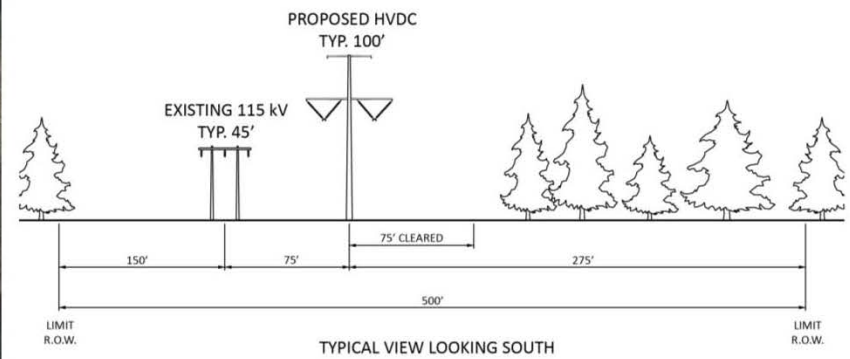
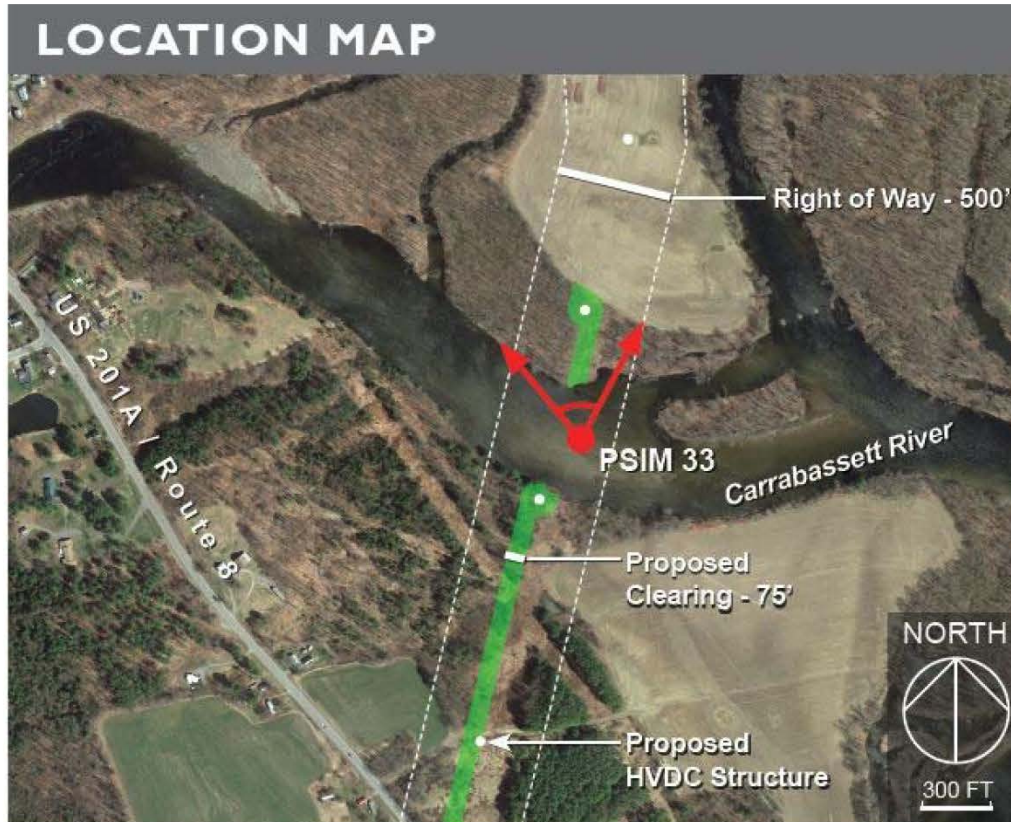


## Appalachian Trail – Bald Mountain - Photosimulation





# Carrabassett River, Anson



## Carrabassett River – Existing Conditions

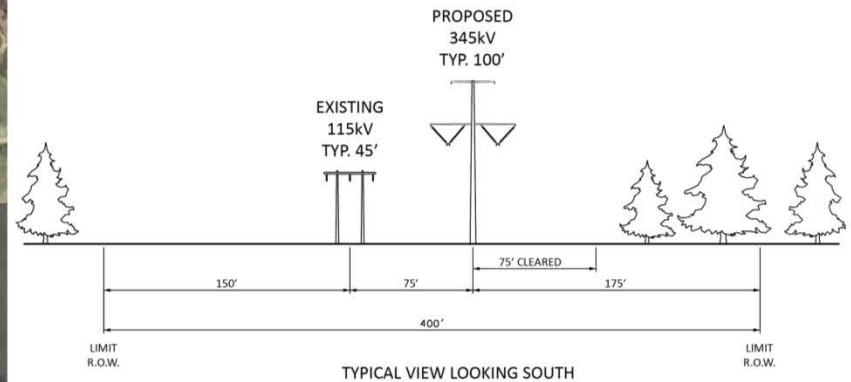
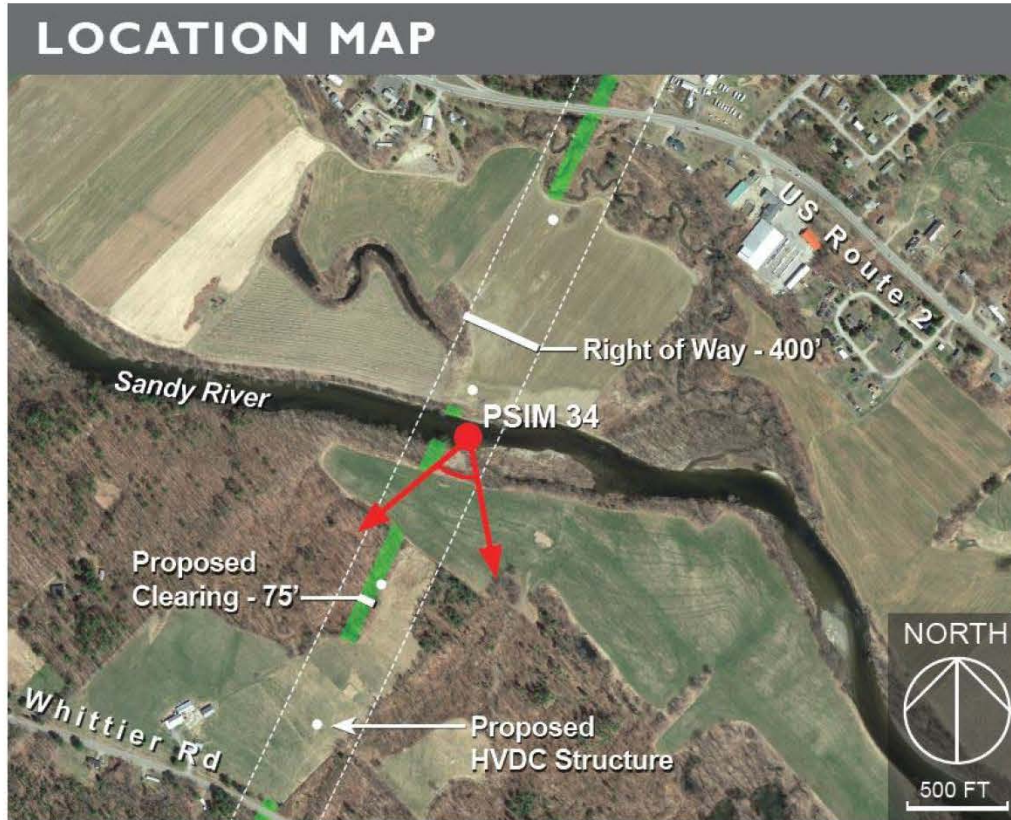




## Carrabassett River – Photosimulation



# Sandy River, Farmington





## Sandy River – Existing Conditions





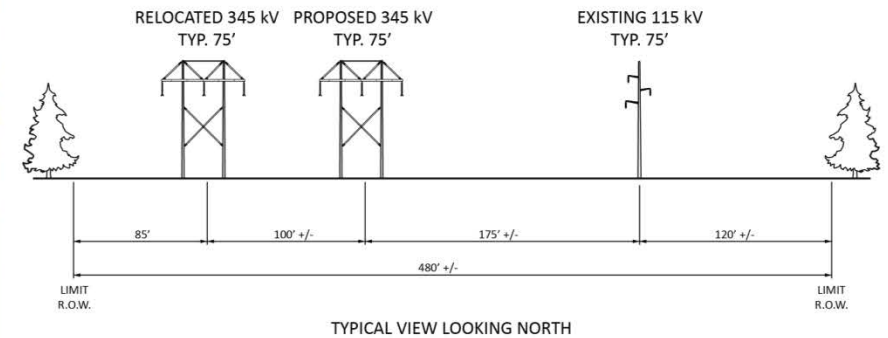
## Sandy River – Photosimulation





# West Branch Sheepscot River, Windsor

## LOCATION MAP





## West Branch Sheepscot River – Existing Conditions





## West Branch Sheepscot River – Photosimulation





## West Branch Sheepscot River – Existing Conditions



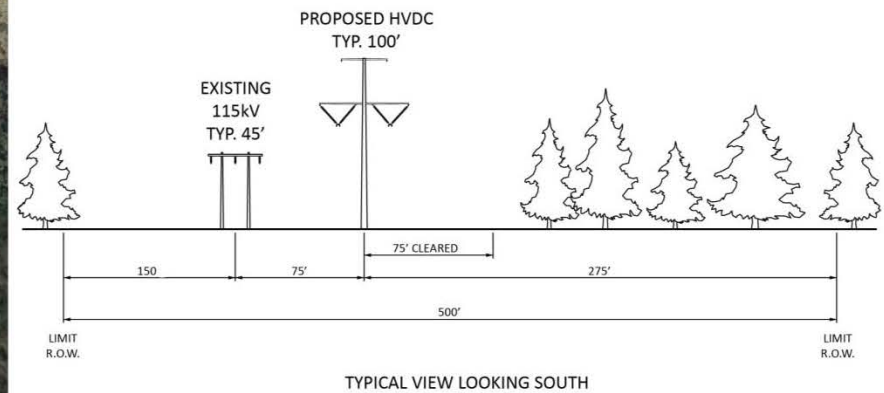
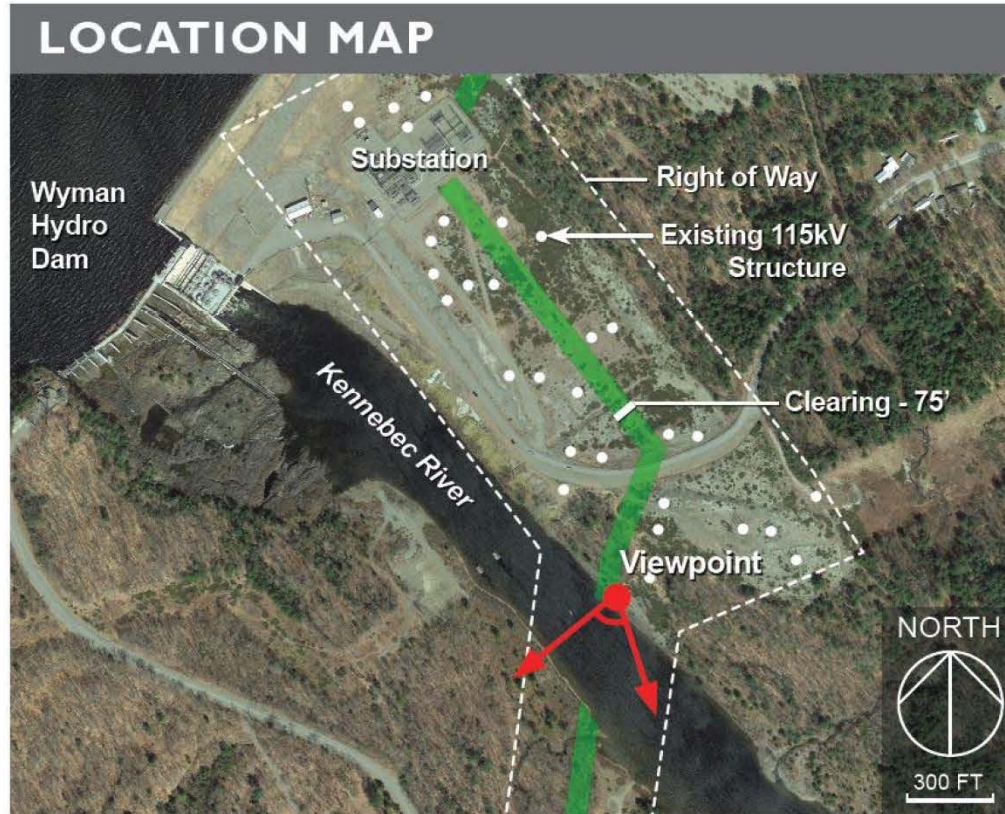


## West Branch Sheepscot River – Photosimulation





# Lower Kennebec River – Wyman Dam, Moscow





## Lower Kennebec River – Existing Conditions



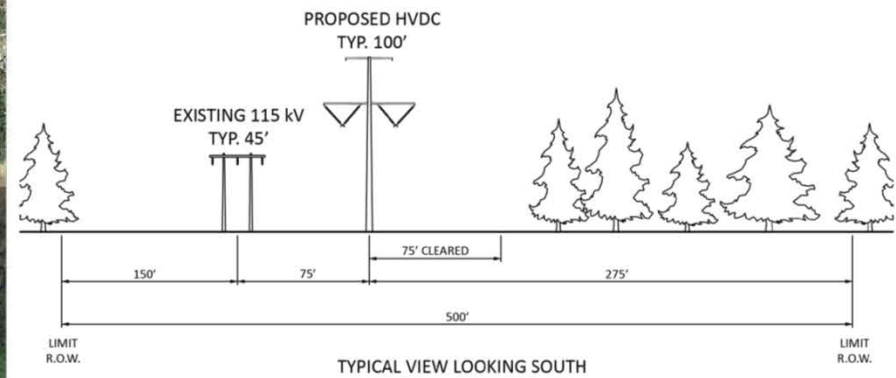
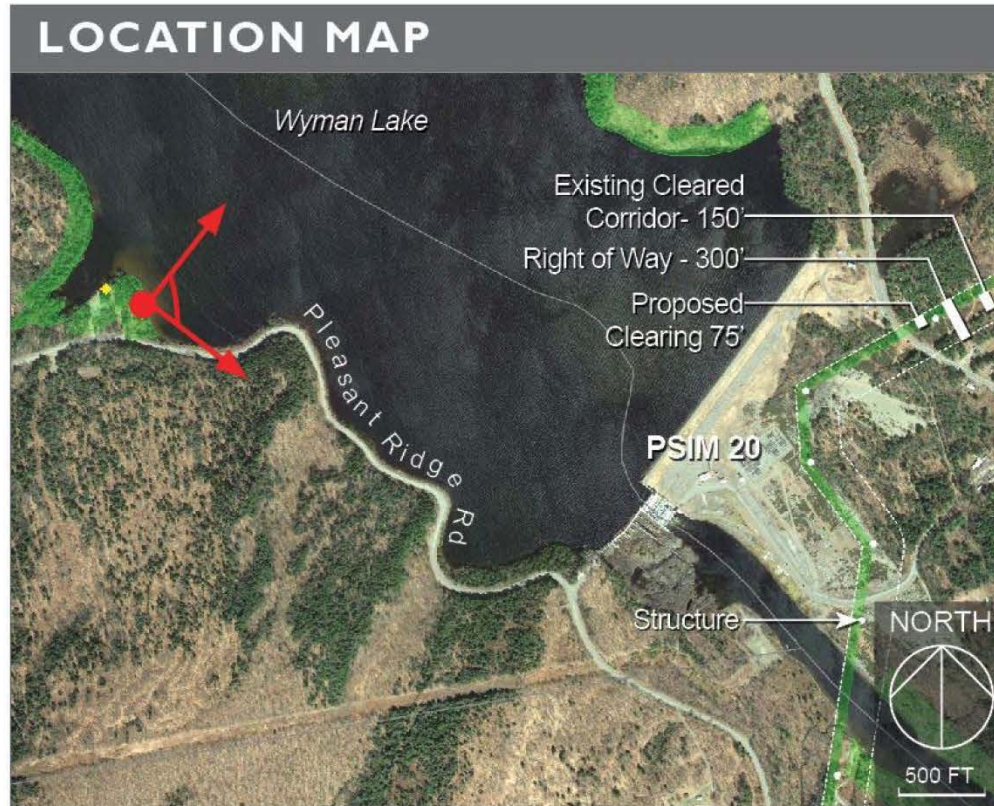


## Lower Kennebec River – Wyman Hydro





# Wyman Lake Recreation Area, Pleasant Ridge Plt.



## Wyman Lake Recreation Area – Existing Conditions



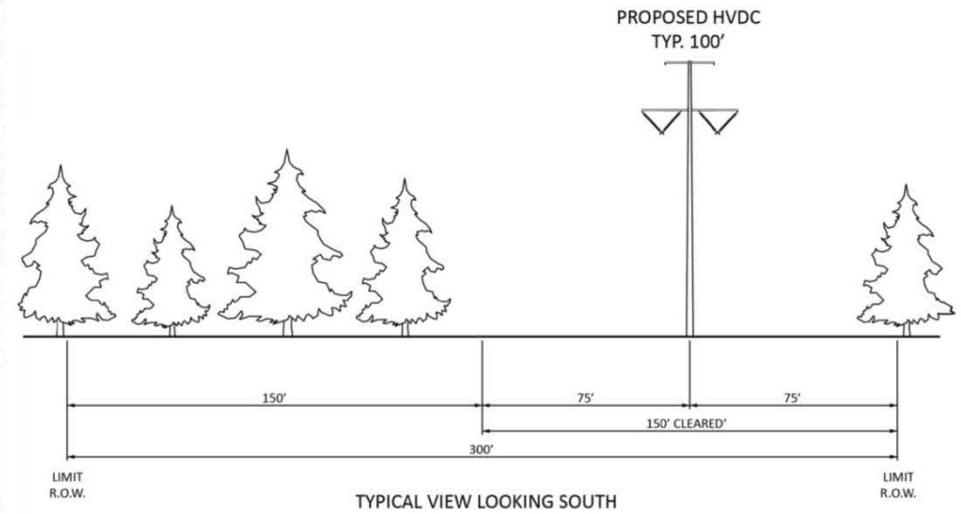


## Wyman Lake Recreation Area – Photosimulation





# No 5 Mountain, T5 R7 BKP WKR - Leuthold Preserve



## No 5 Mountain – Existing Conditions

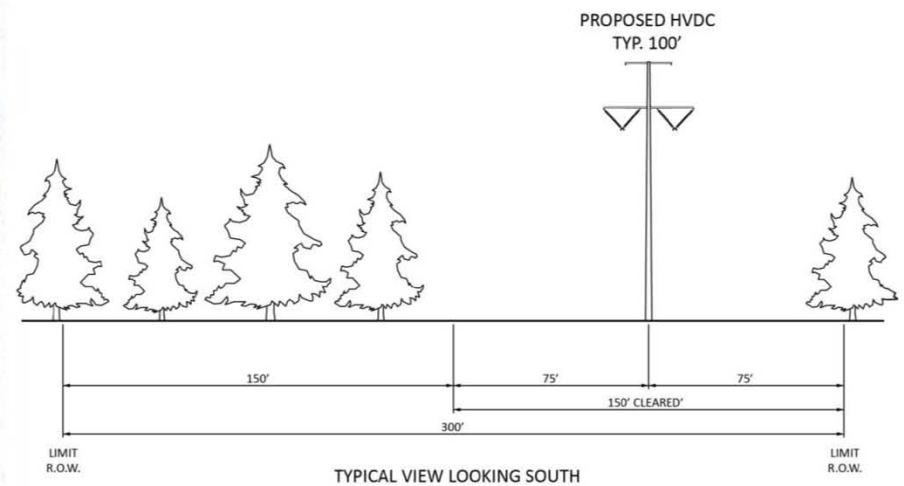
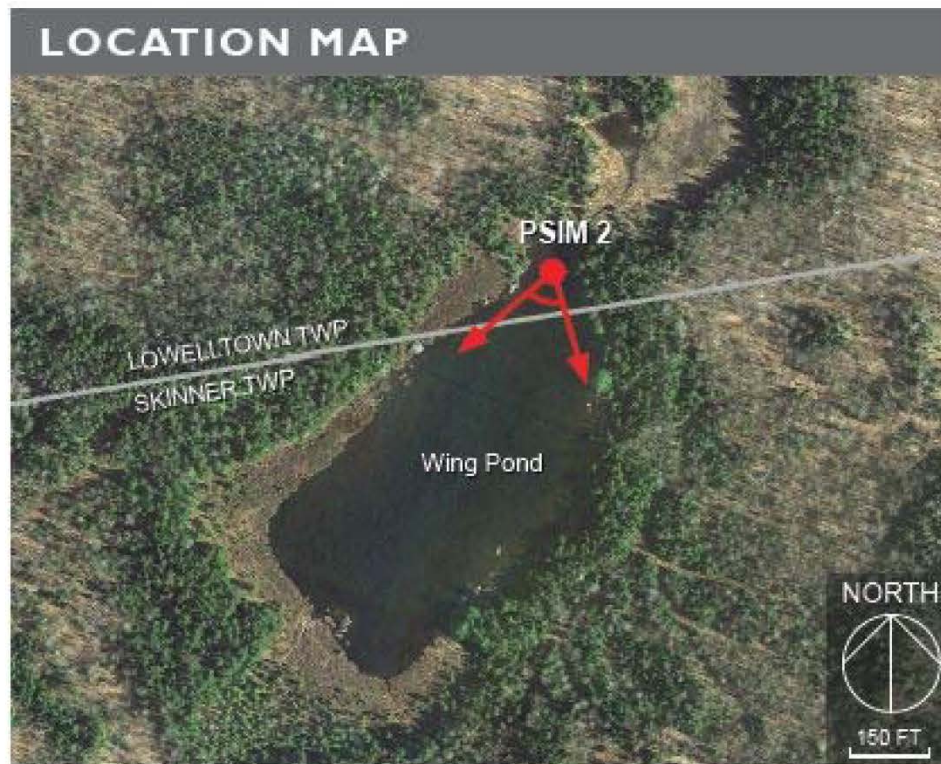




## No 5 Mountain – Photosimulation

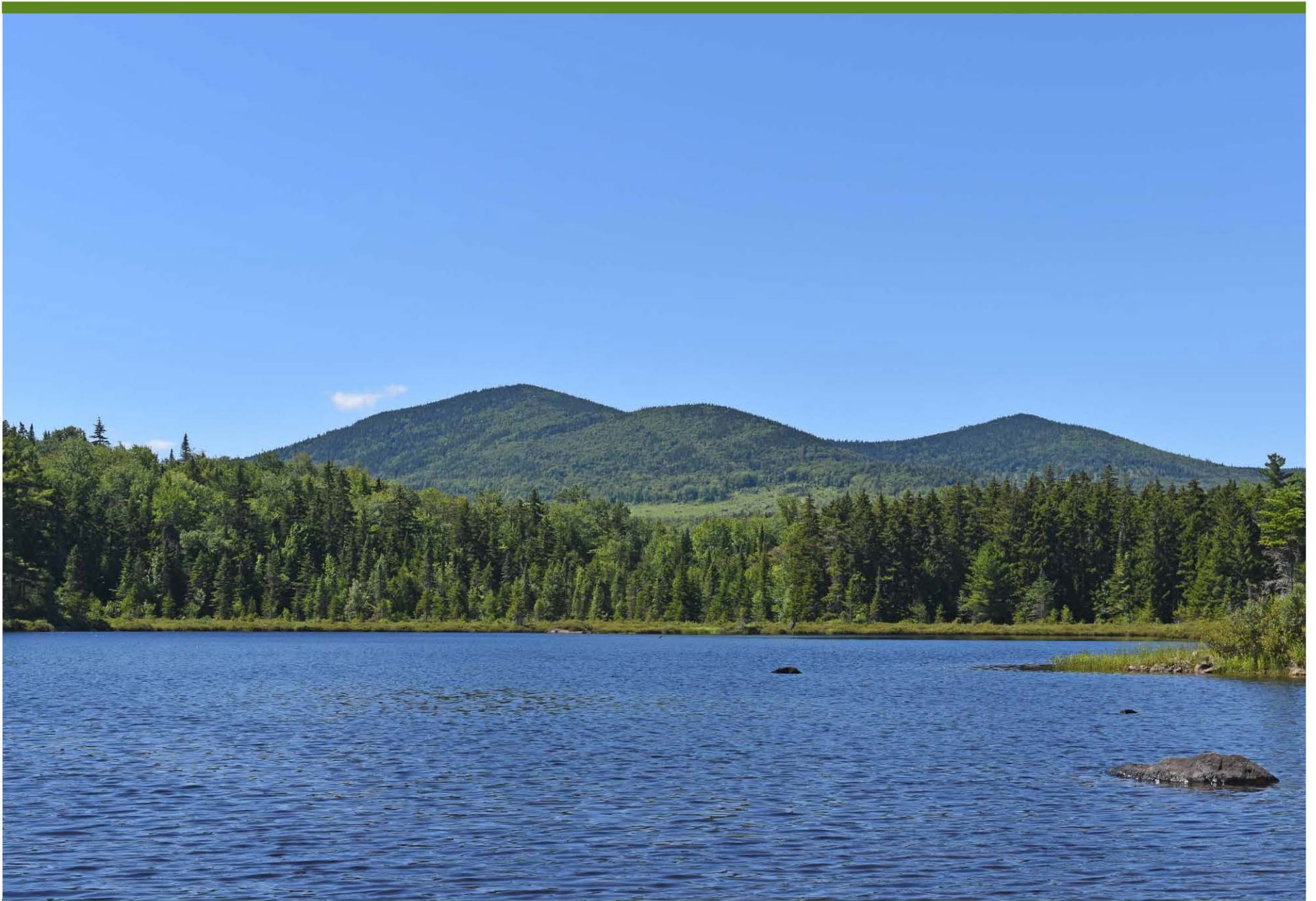


## Wing Pond, Lowelltown Twp.



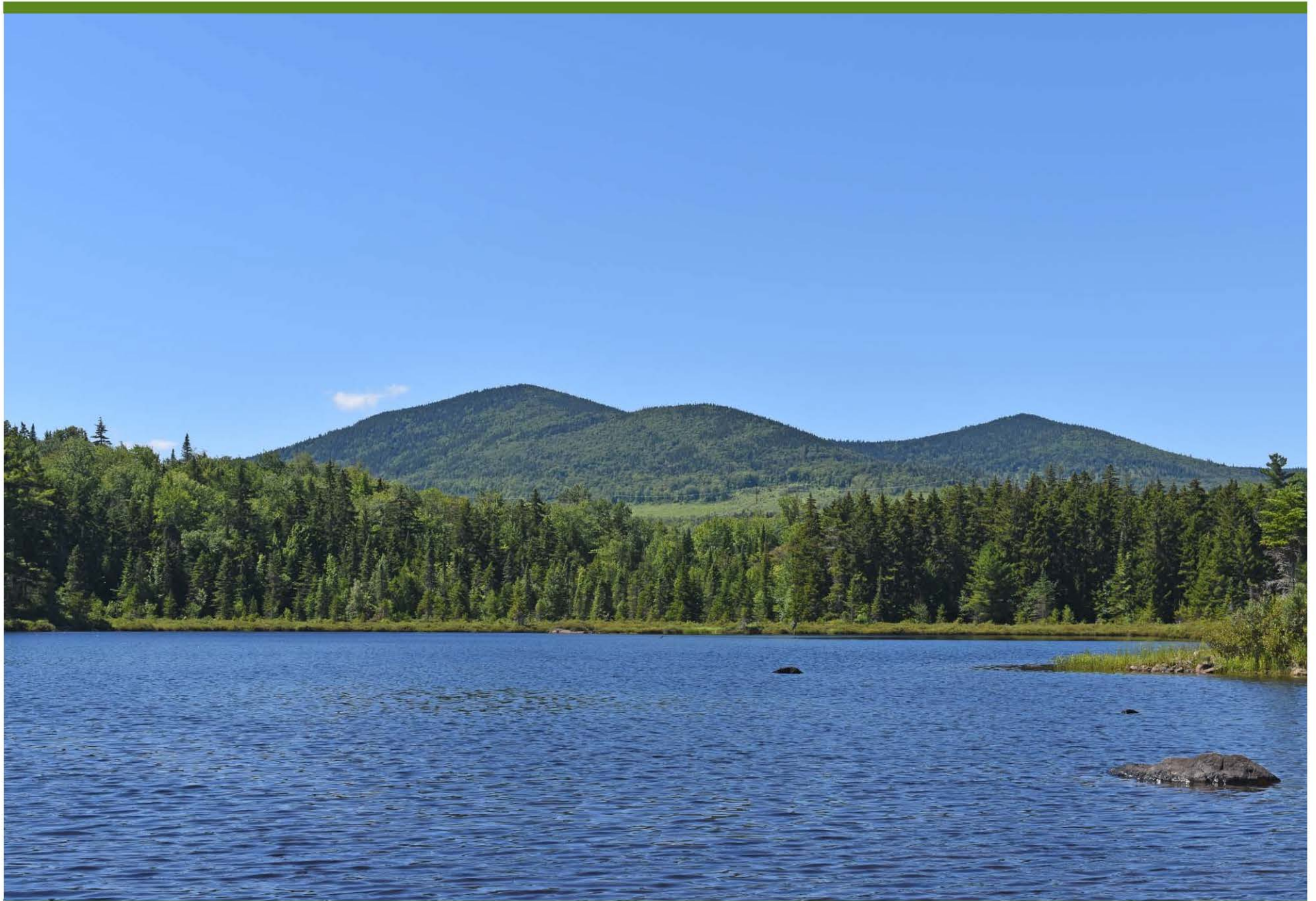


## Wing Pond - Existing Conditions

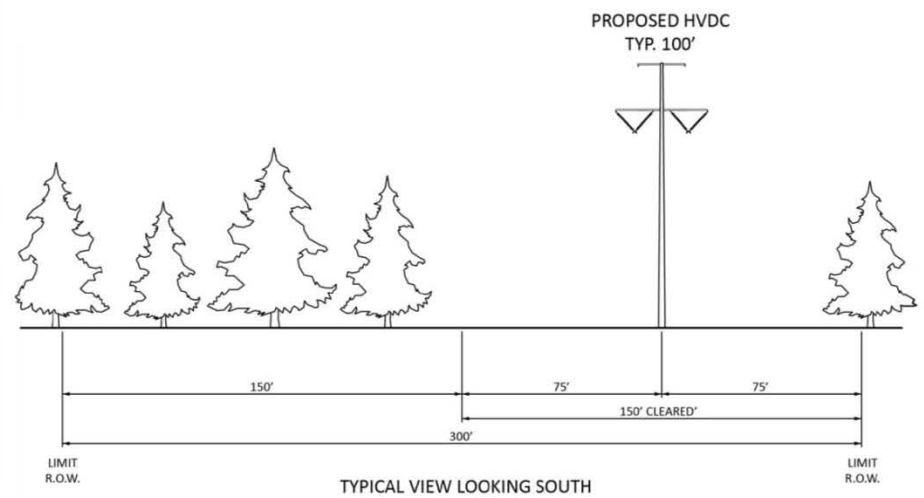
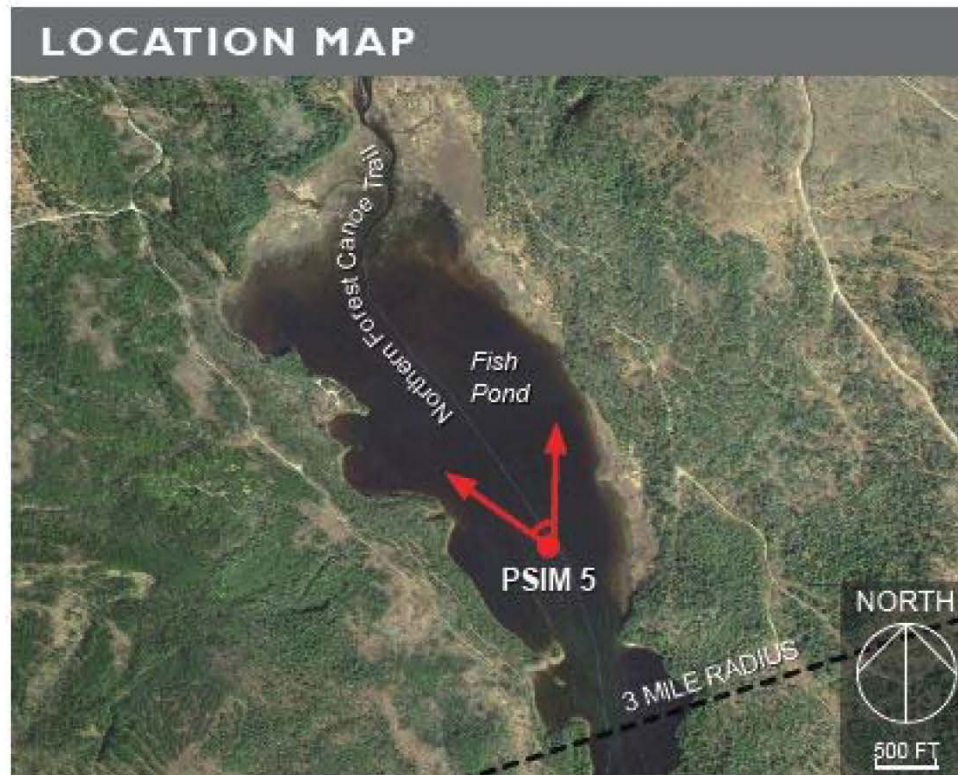




## Wing Pond - Photosimulations

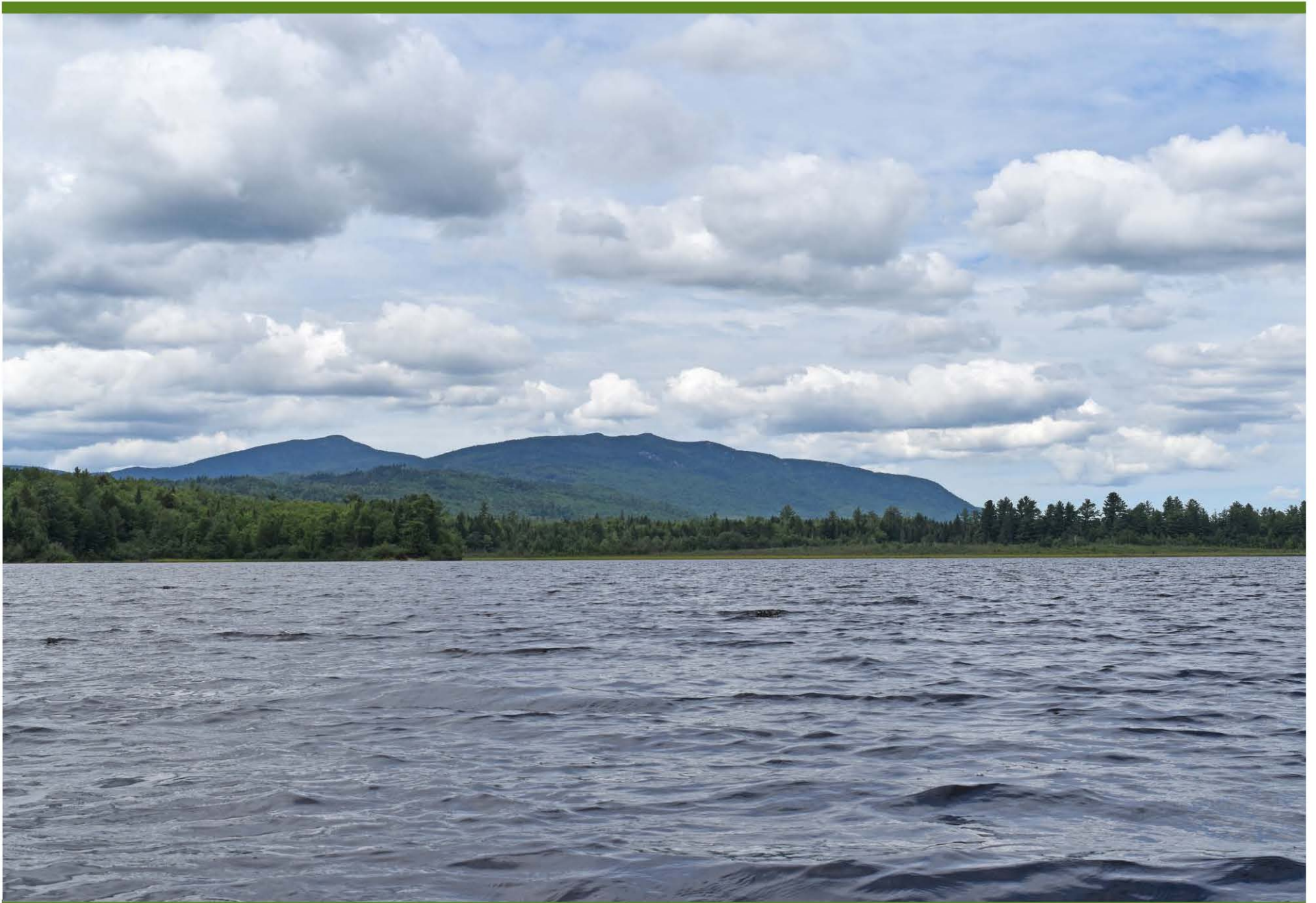


# Fish Pond, Hobbstown Twp

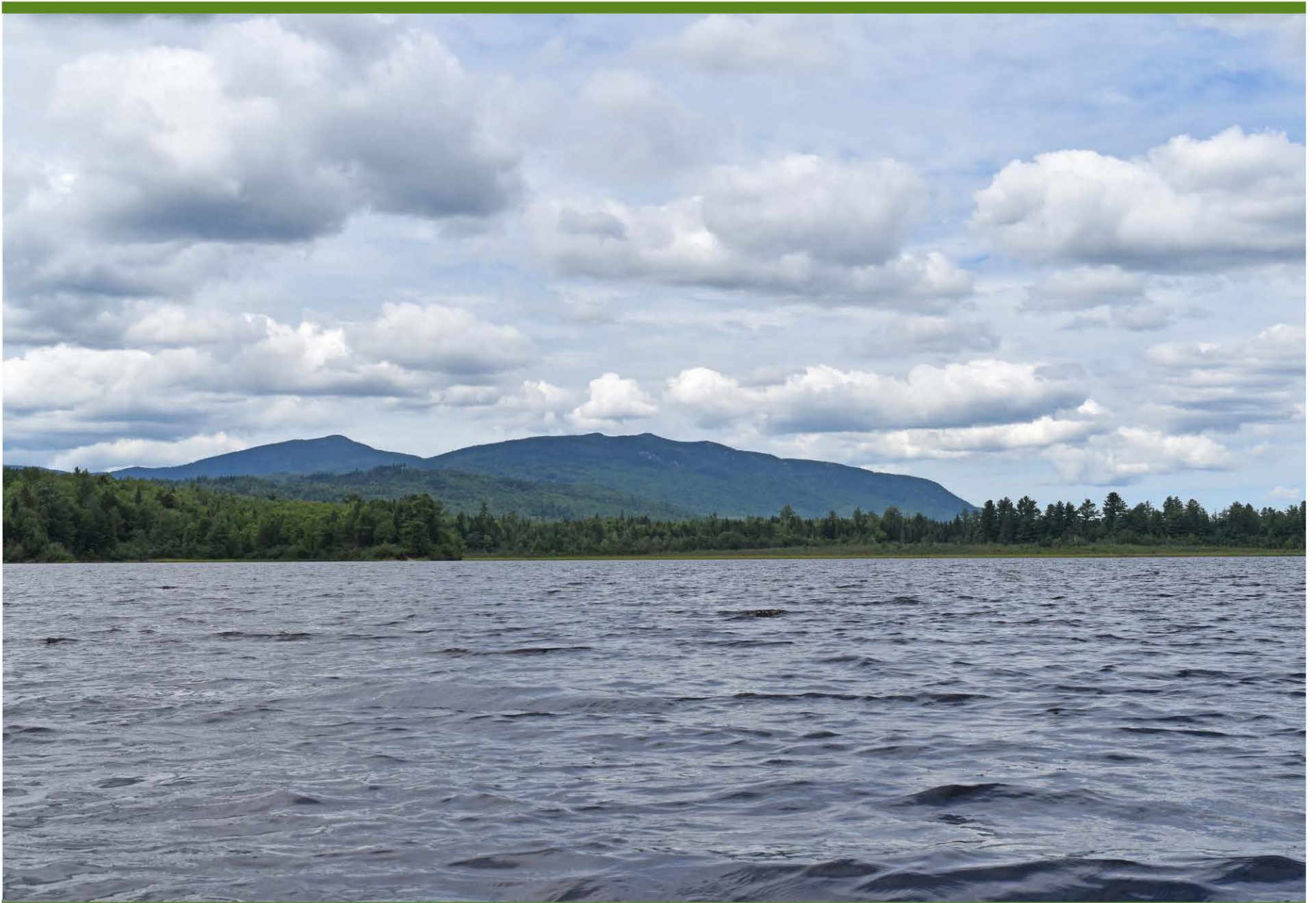




## Fish Pond – Existing Conditions



## Fish Pond – Photosimulation



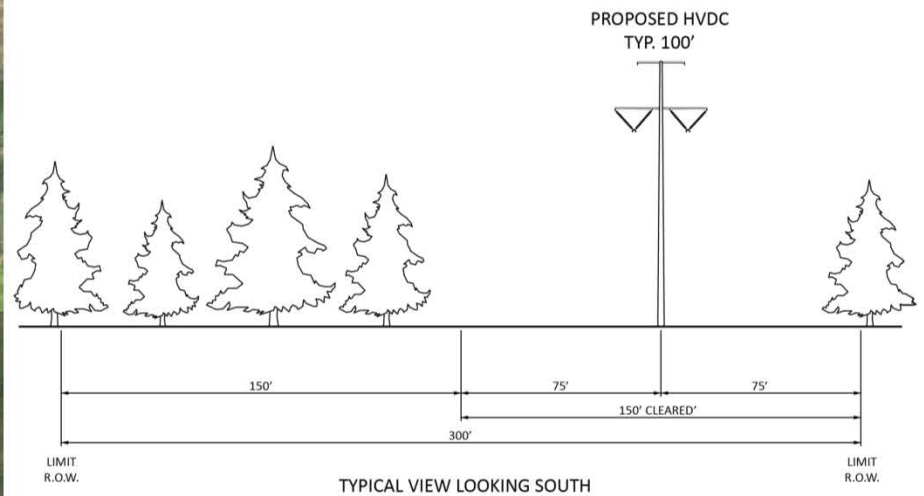


## Fish Pond – Photosimulation





## Parlin Pond, Parlin Pond Twp.



## Parlin Pond – Existing Conditions

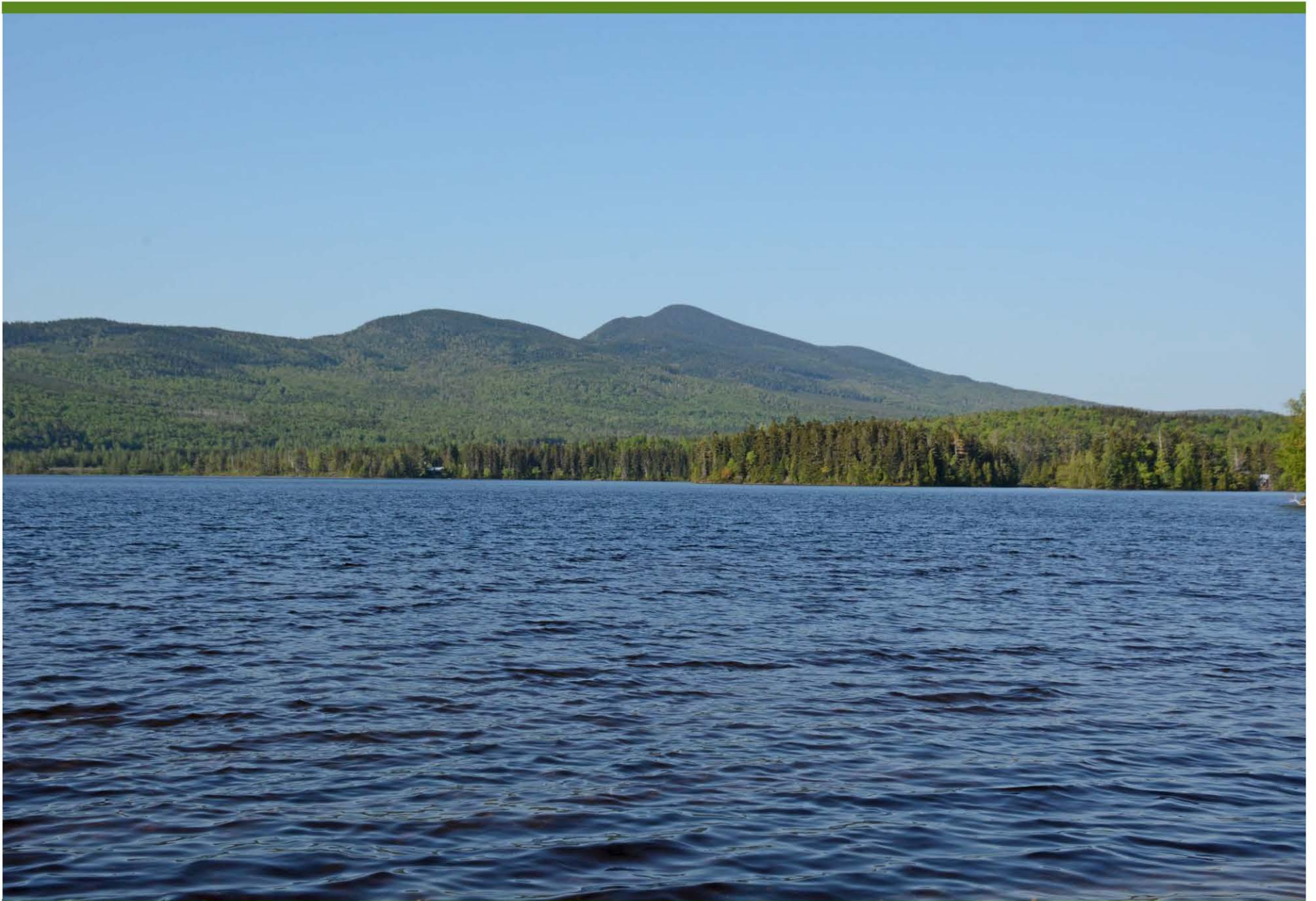




## Parlin Pond – Photosimulation

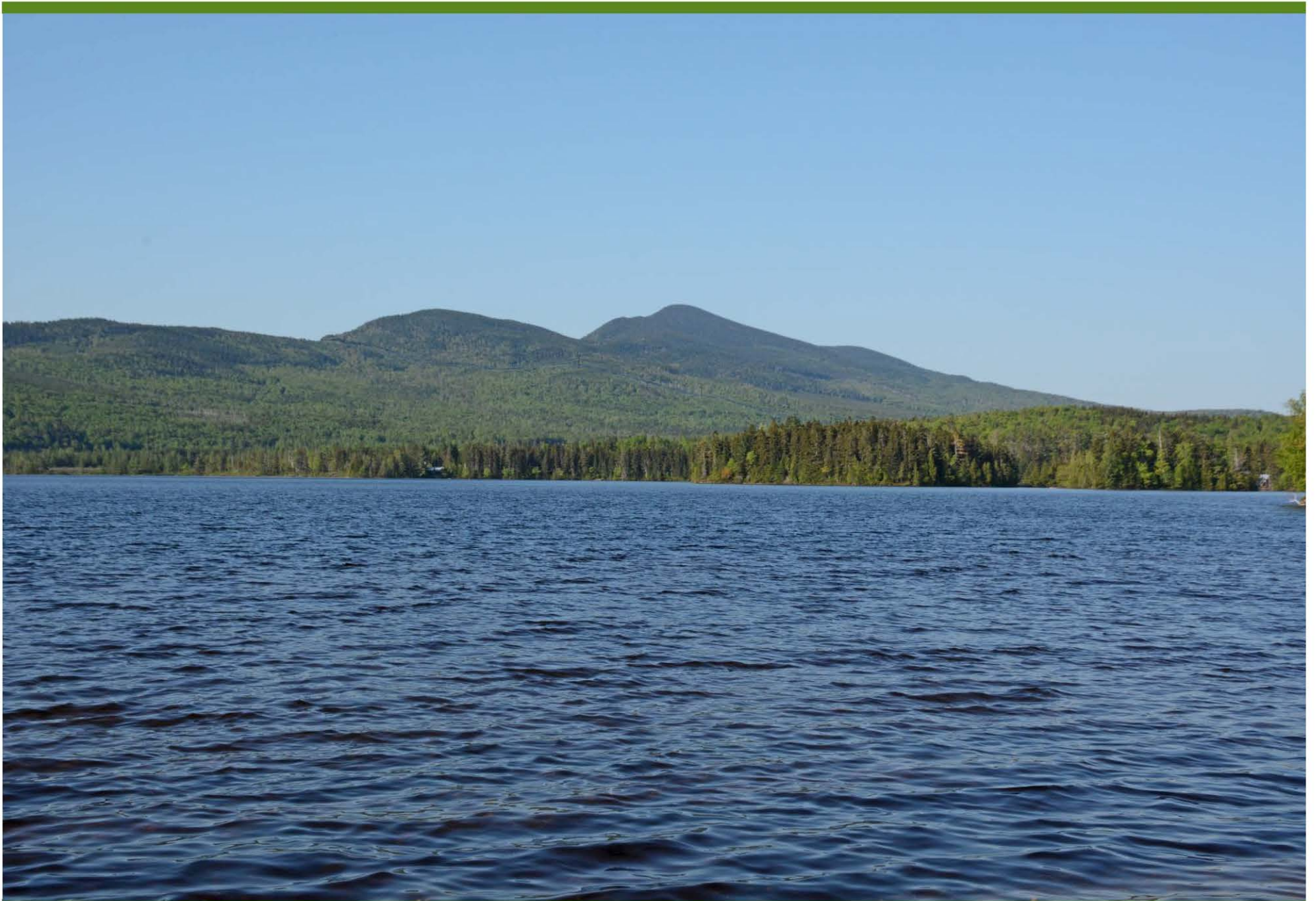


## Parlin Pond – Existing Conditions



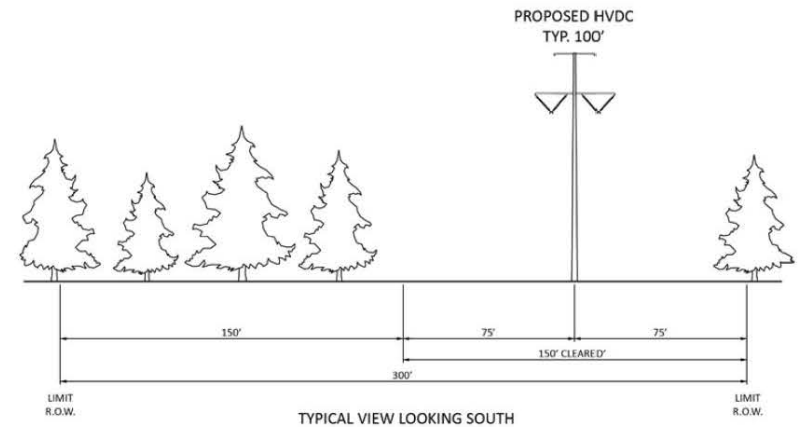
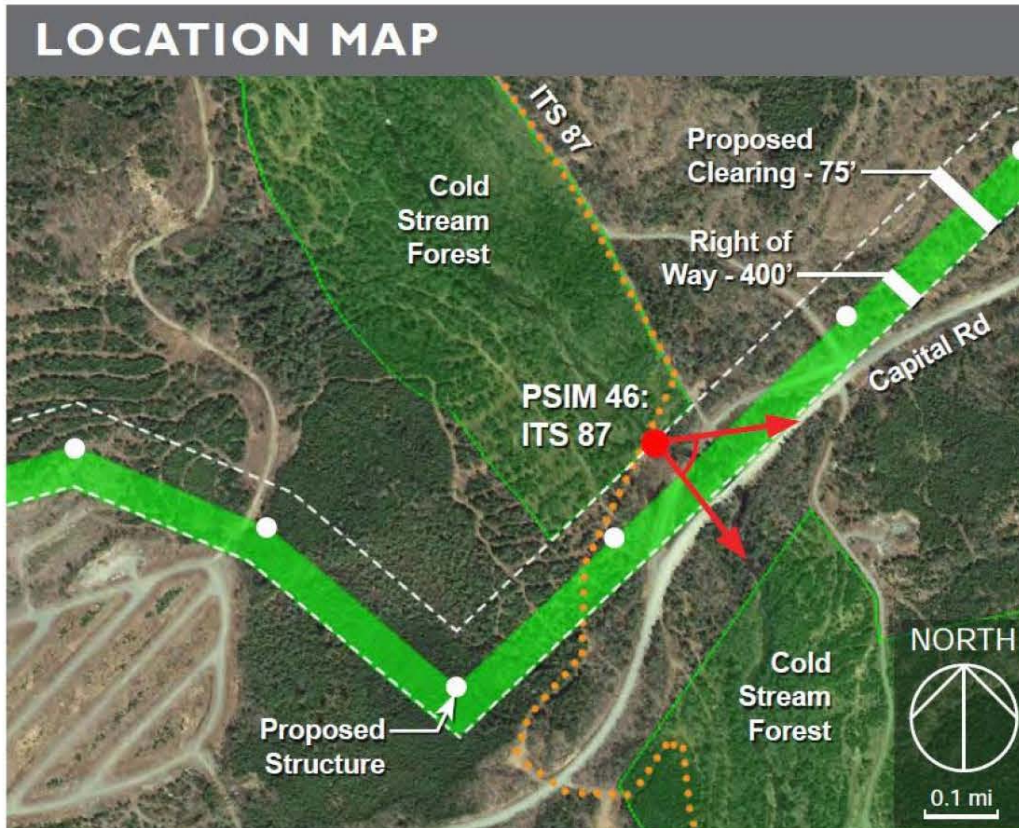


## Parlin Pond – Photosimulation





# ITS 87, Cold Stream Forest Parcel, Johnson Mountain Twp.





## ITS 87, Cold Stream Forest Parcel – Existing Conditions



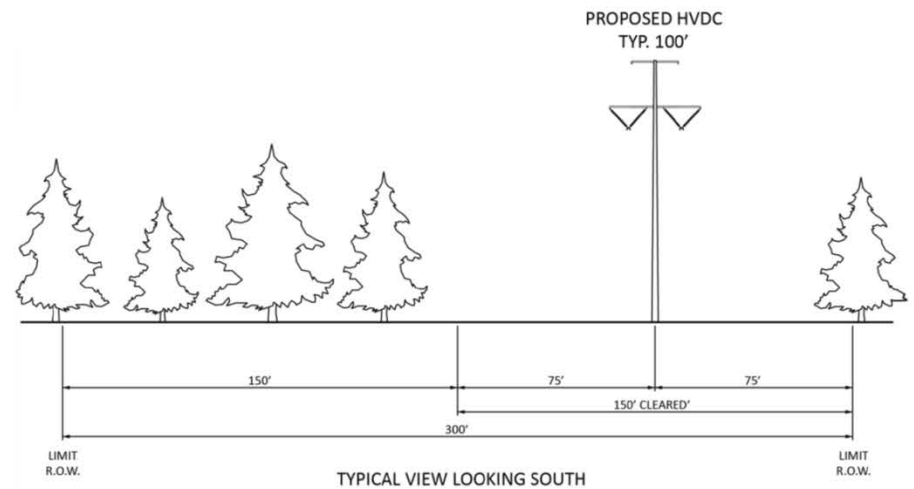
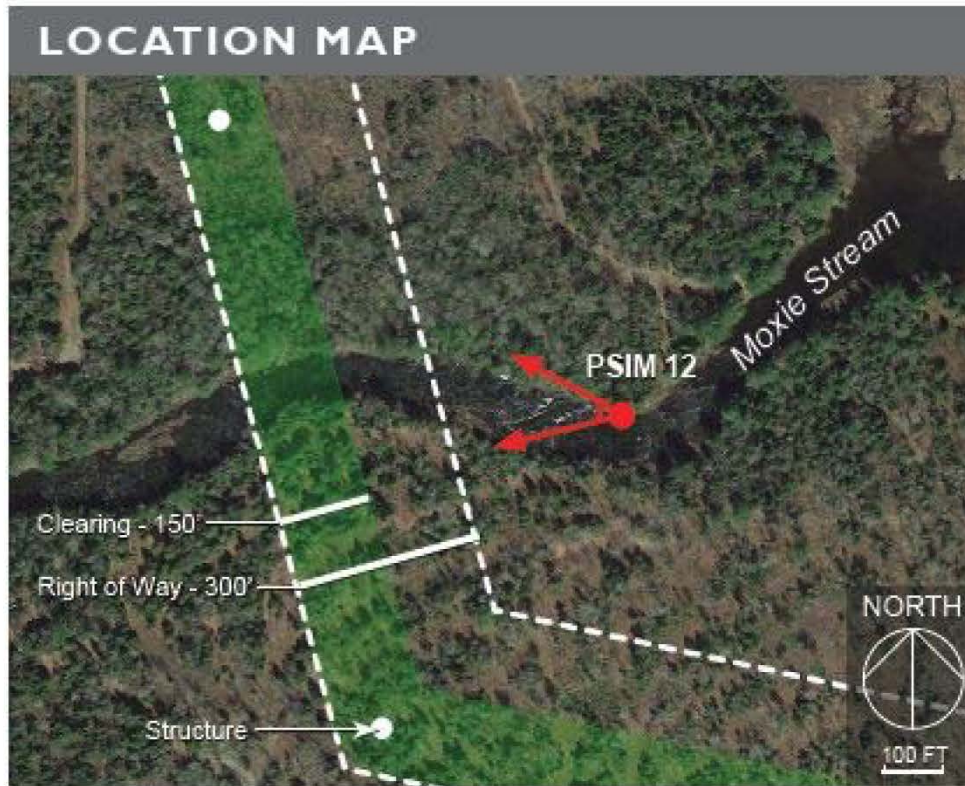


## ITS 87, Cold Stream Forest Parcel – Photosimulation



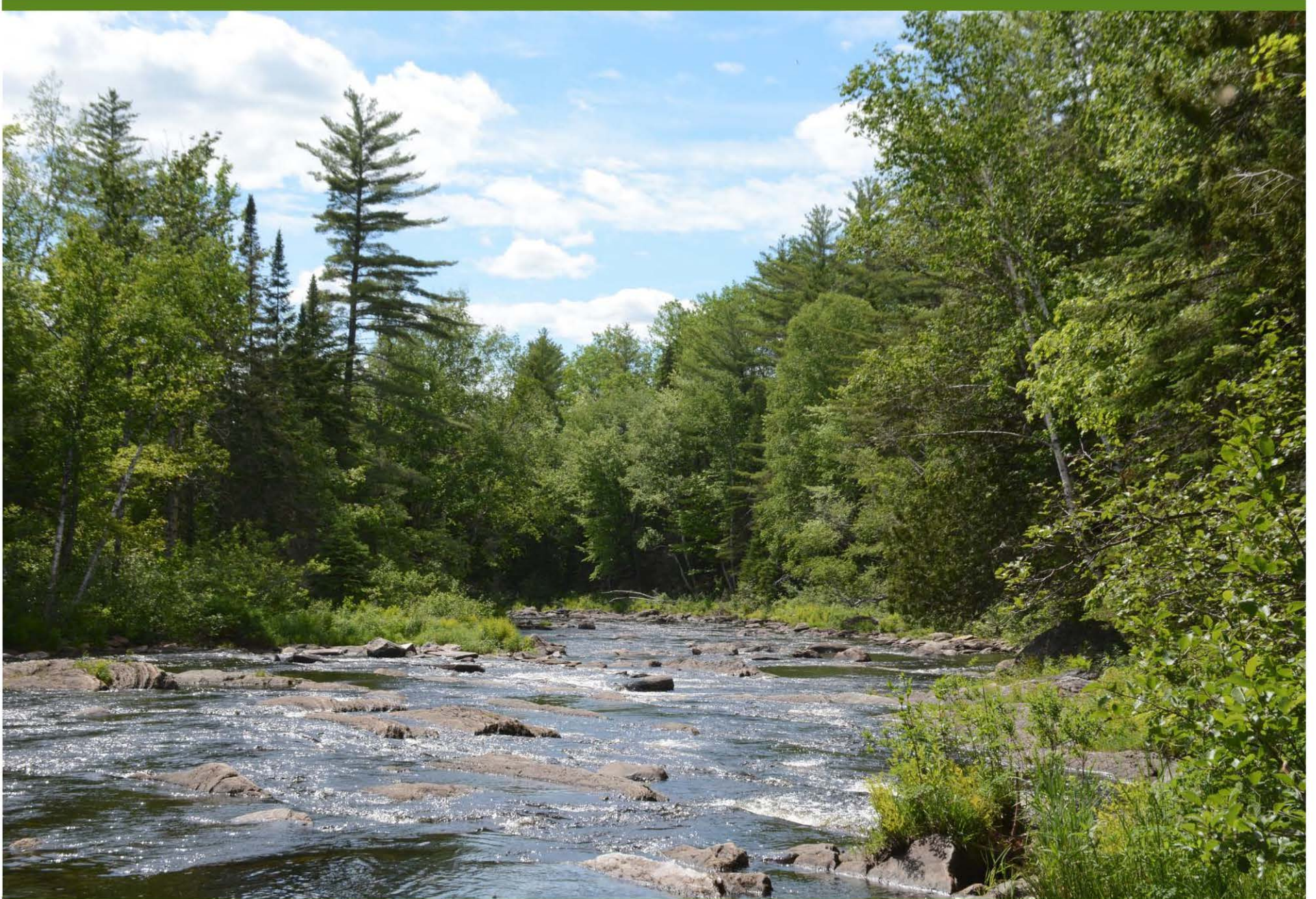


# Moxie Stream, Moxie Gore



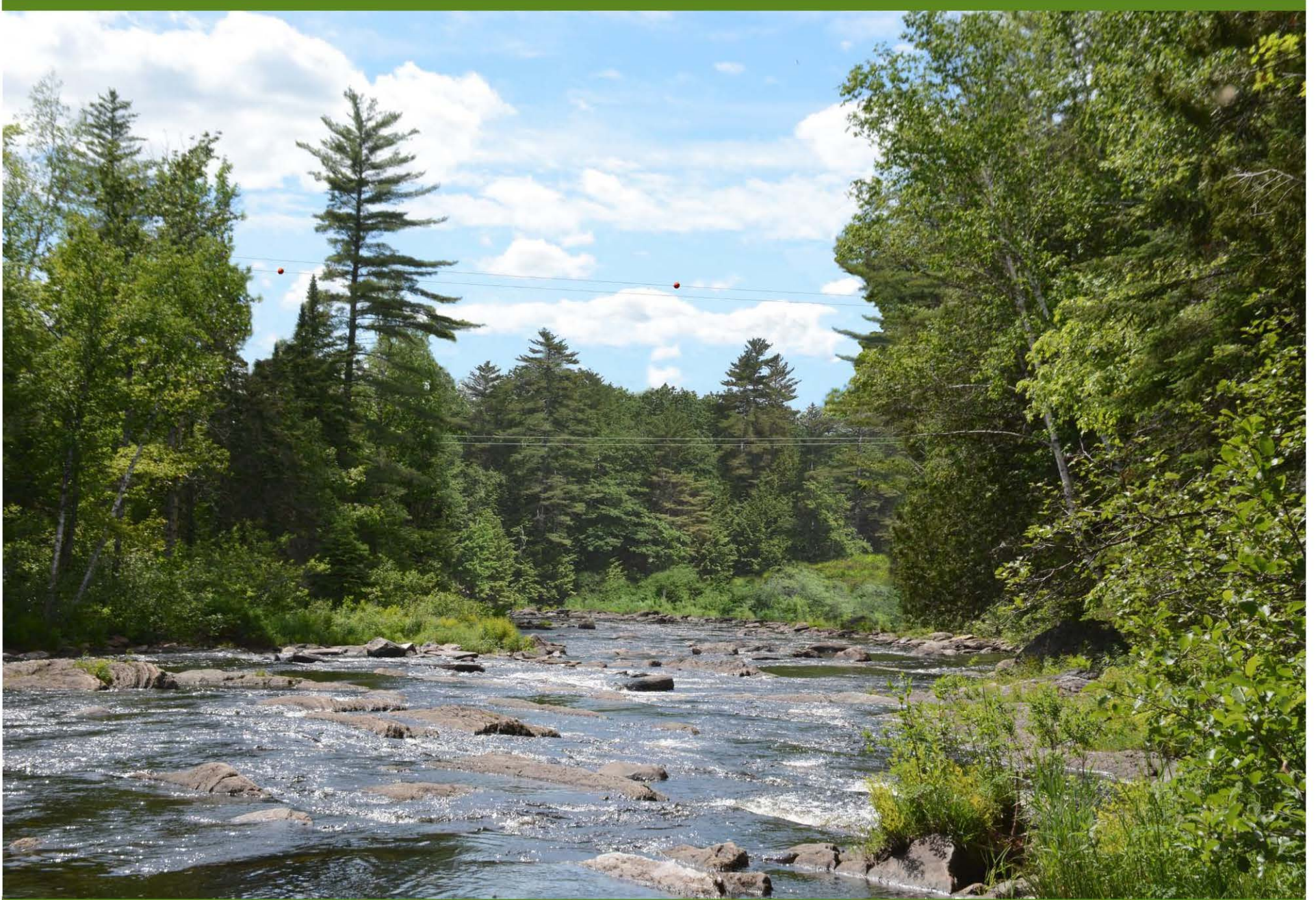


## Moxie Stream – Existing Conditions



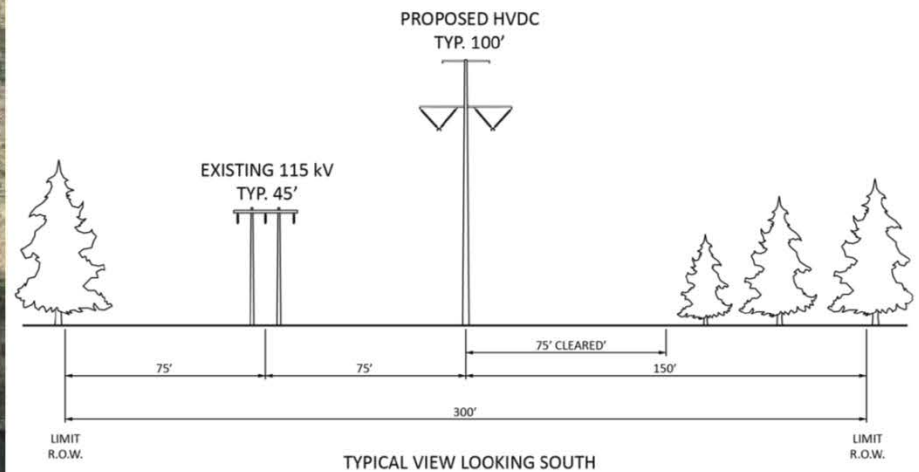
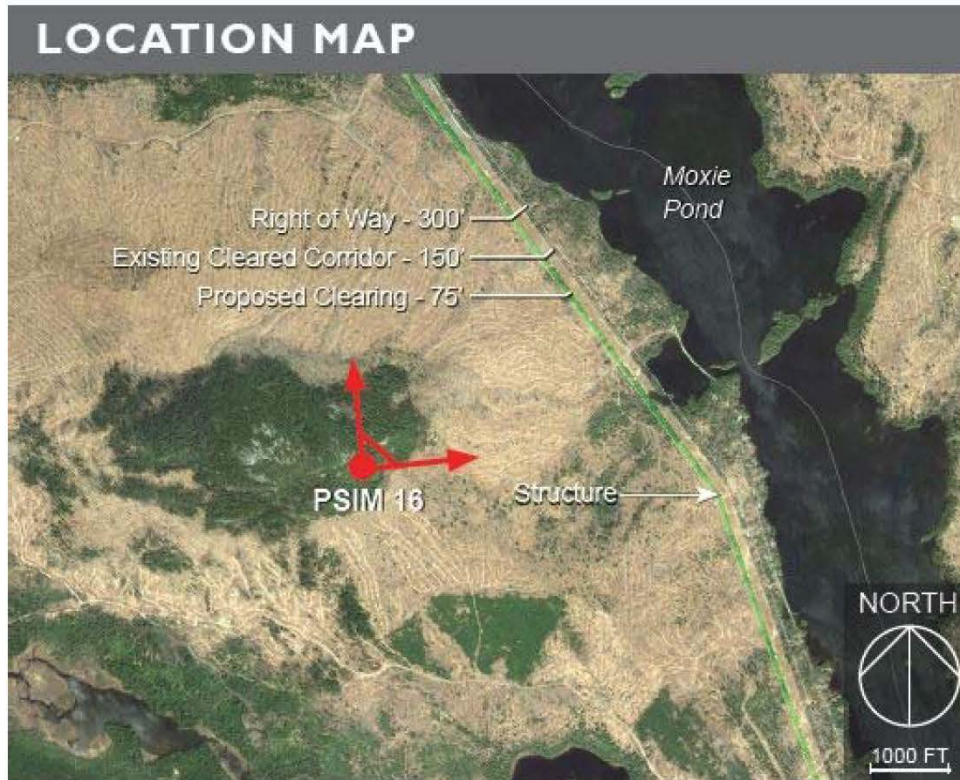


## Moxie Stream – Photosimulation





# Mosquito Mountain, The Forks Plt., on Bayroot LLC land



## Mosquito Mountain – Existing Conditions

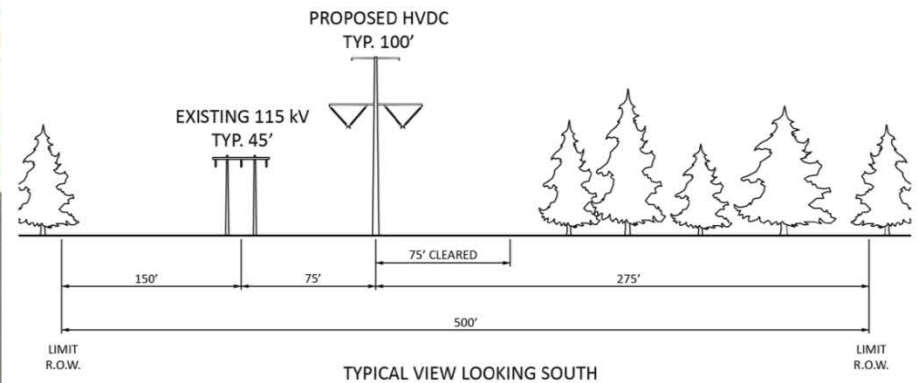
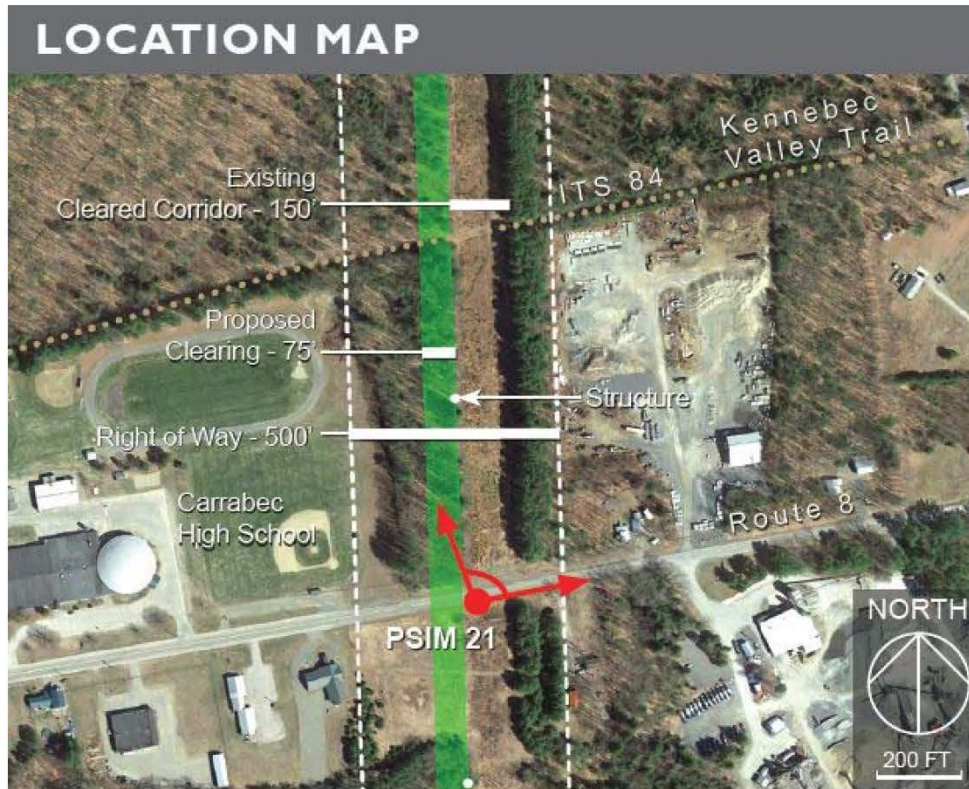




## Mosquito Mountain – Photosimulation



## Route 8, Anson





## Route 8 – Existing Conditions



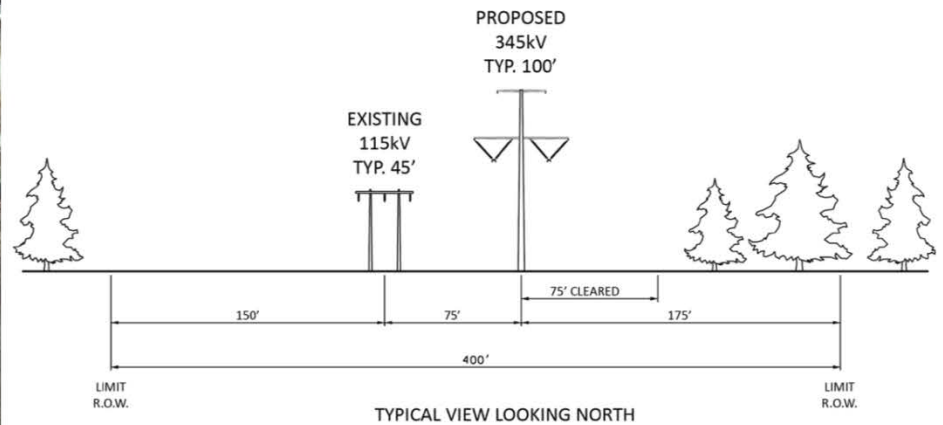


## Route 8 – Photosimulation





## Route 2, Farmington





## Route 2 – Existing Conditions



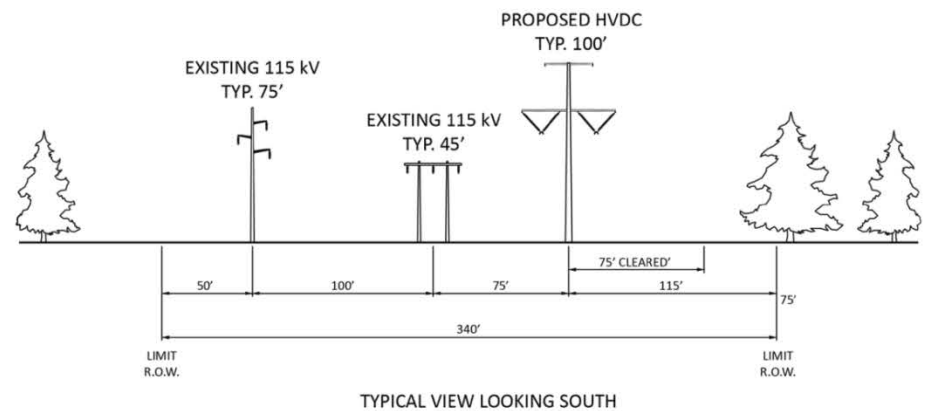
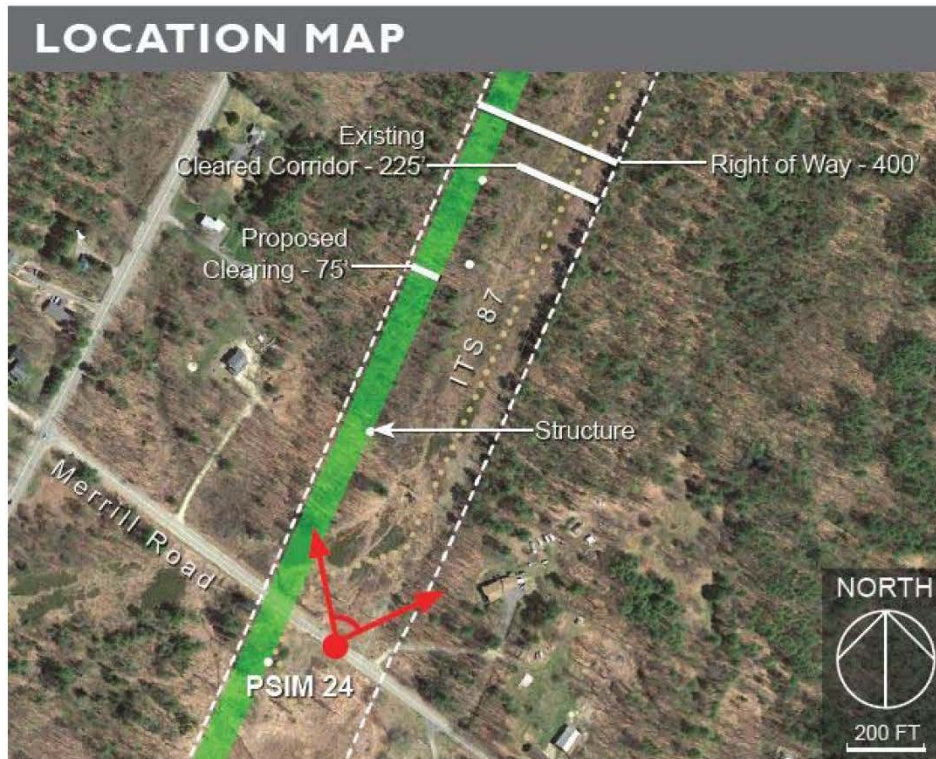


## Route 2 – Photosimulation





# Merrill Road, Lewiston





## Merrill Road – Existing Conditions



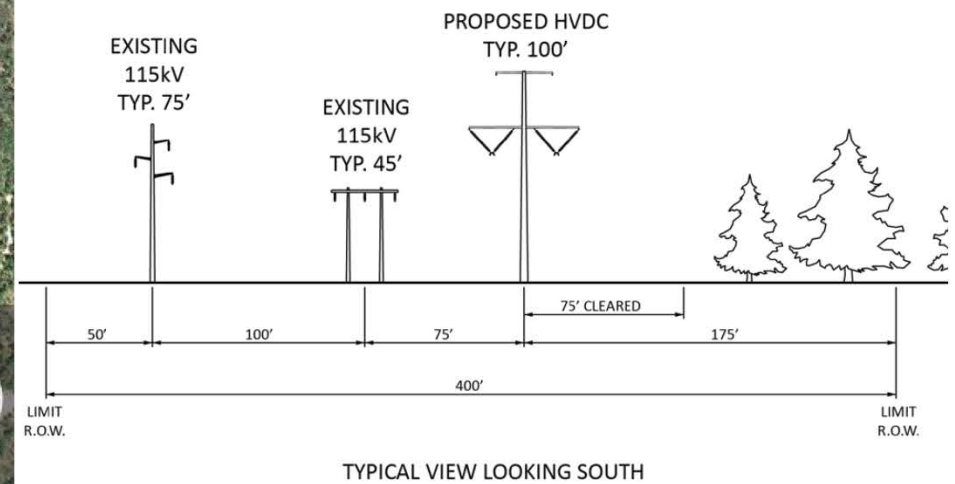
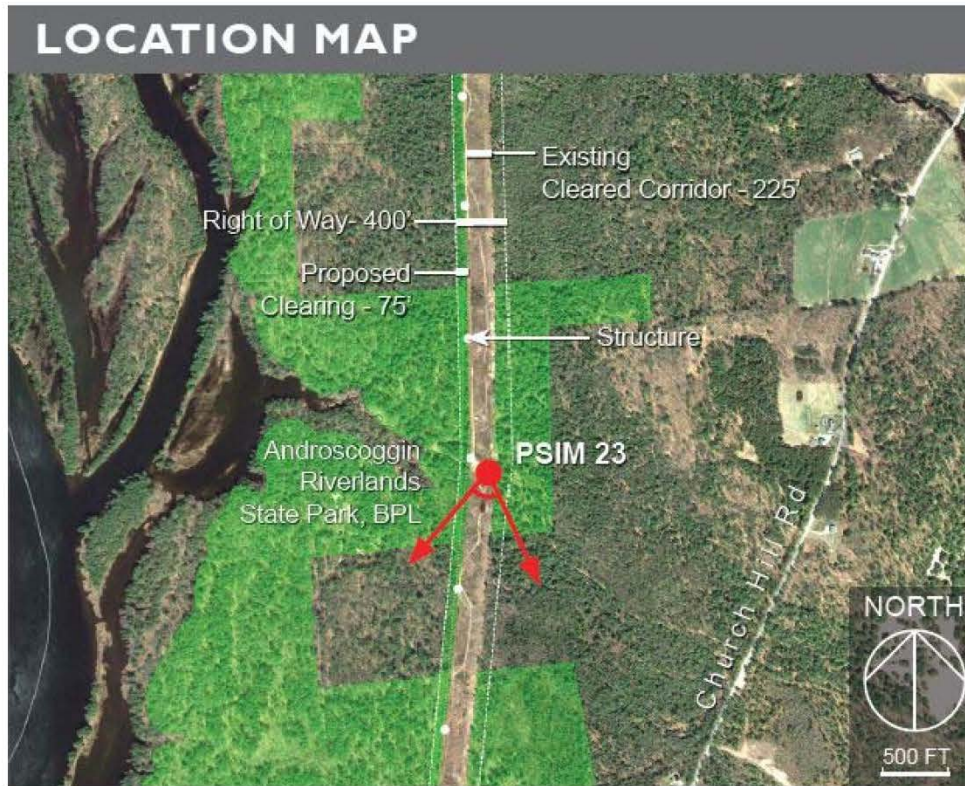


## Merrill Road – Photosimulation





# Androscoggin Riverlands State Park, Leeds





## Androscoggin Riverlands State Park – Existing Conditions



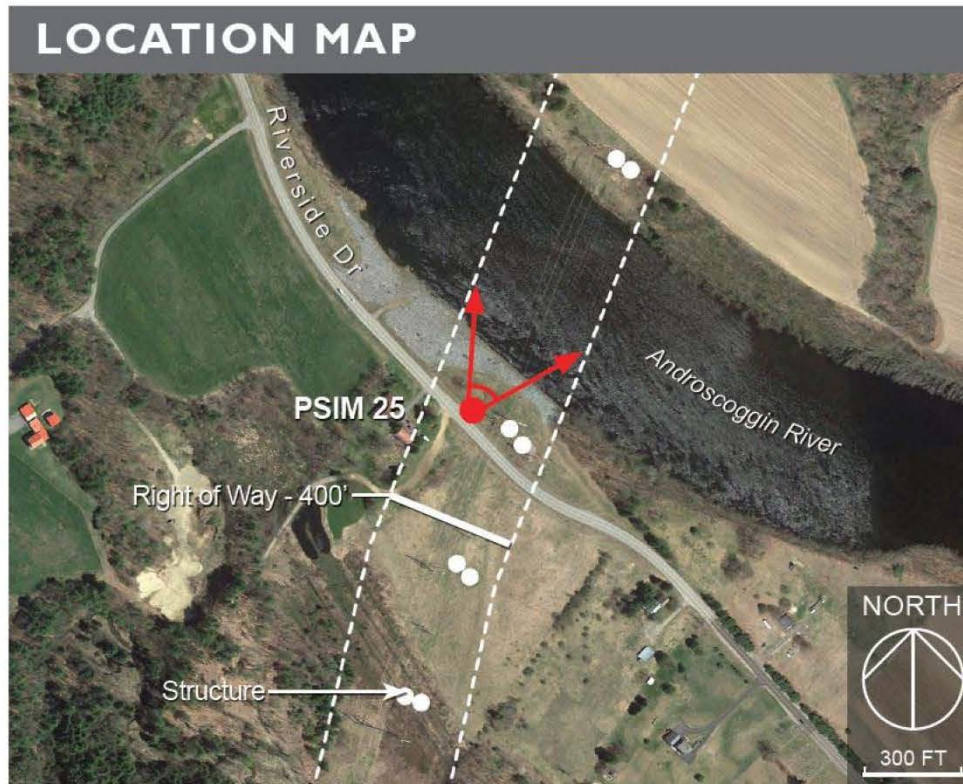


## Androscoggin Riverlands State Park – Photosimulations

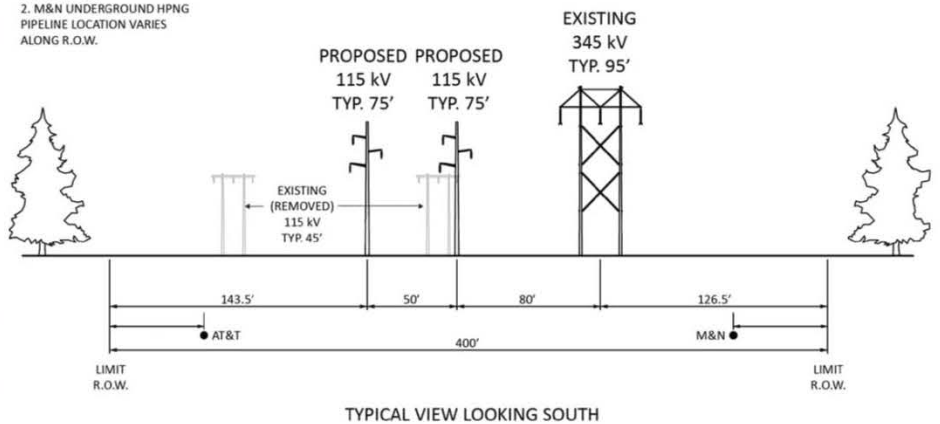




# Riverside Drive, Auburn



NOTE:  
 1. UNDERGROUND FIBER OPTIC  
 CABLE LOCATION VARIES  
 ALONG R.O.W.  
 2. M&N UNDERGROUND HPNG  
 PIPELINE LOCATION VARIES  
 ALONG R.O.W.



## Riverside Drive, Auburn – Existing Conditions



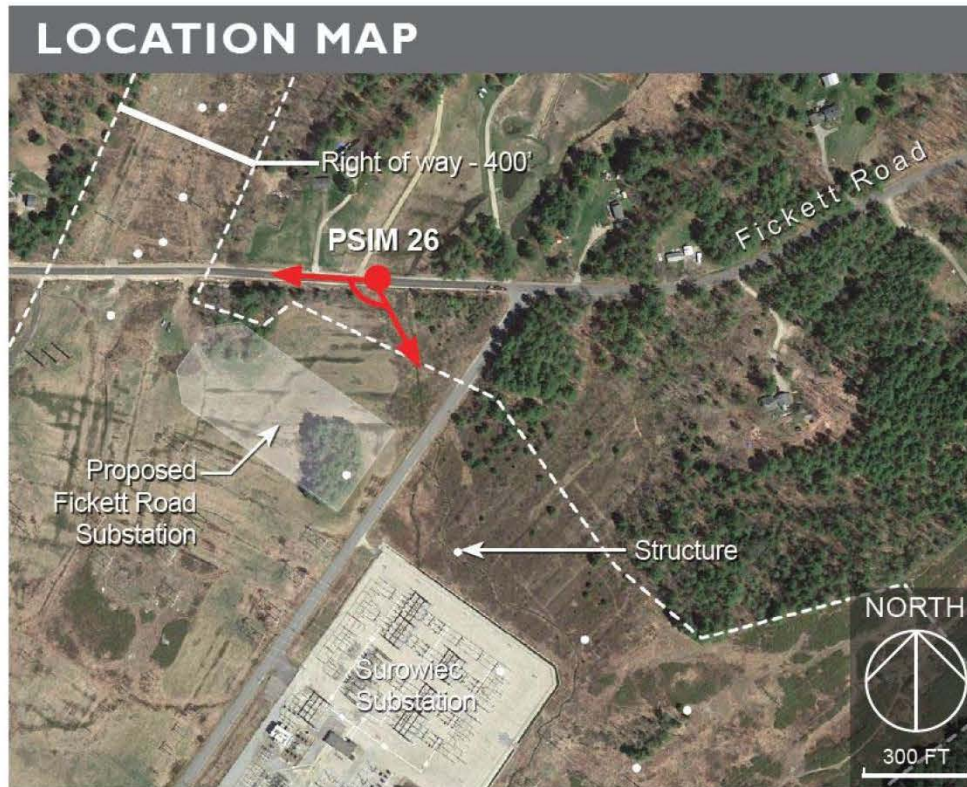


## Riverside Drive, Auburn – Photosimulation

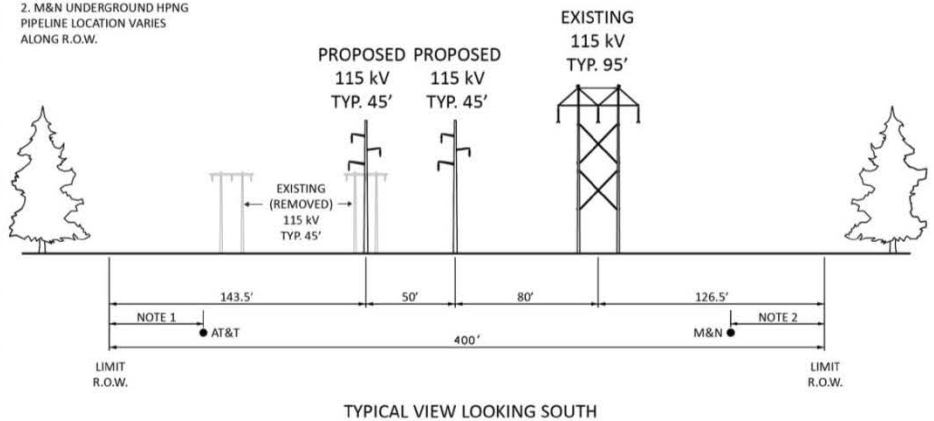




# Fickett Road Substation, Pownal



NOTE:  
 1. UNDERGROUND FIBER OPTIC  
 CABLE LOCATION VARIES  
 ALONG R.O.W.  
 2. M&N UNDERGROUND HPNG  
 PIPELINE LOCATION VARIES  
 ALONG R.O.W.





## Fickett Road, Pownal – Existing Conditions

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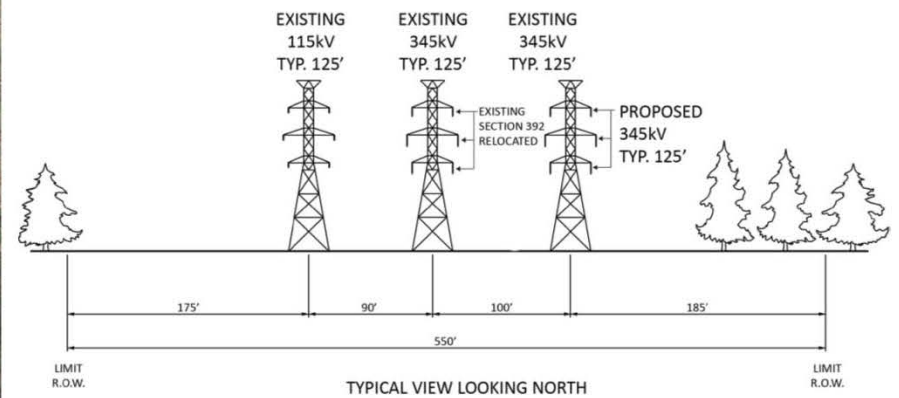
## Fickett Road, Pownal - Photosimulations

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# Route 1, Wiscasset





## Route 1, Wiscasset – Existing Conditions

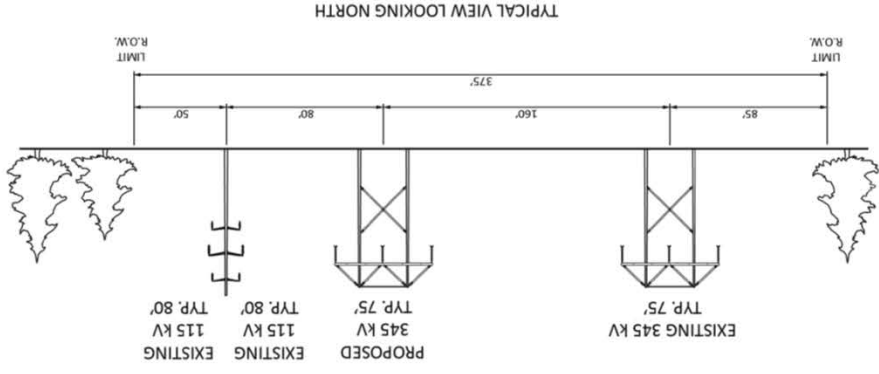
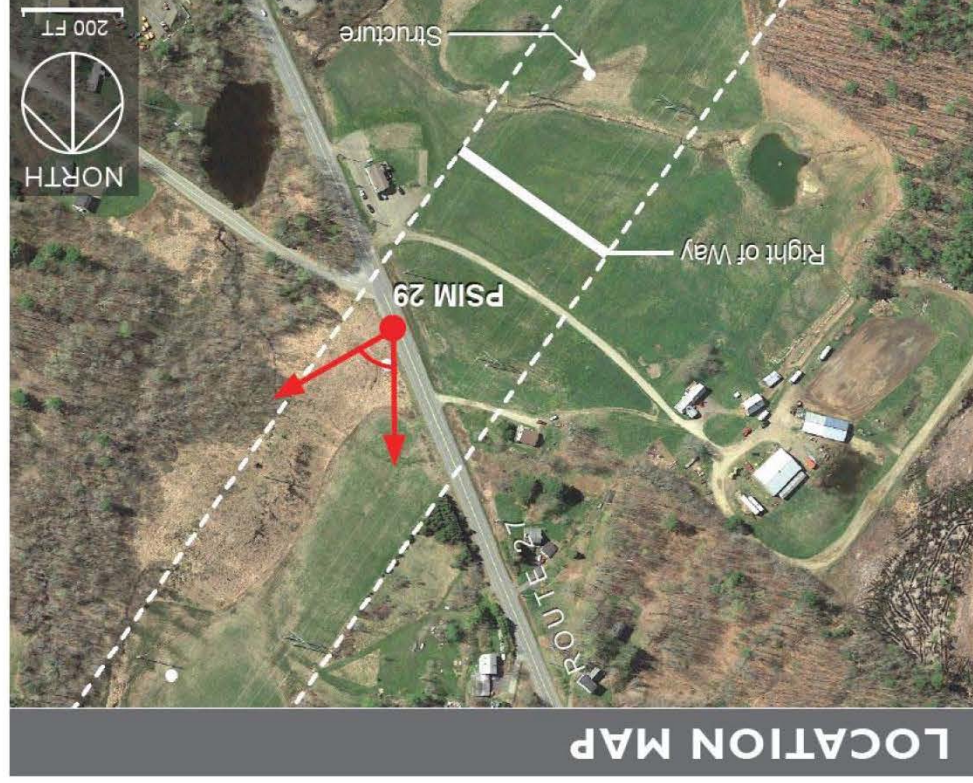




## Route 1, Wiscasset – Photosimulation







## Route 27, Wiscasset – Existing Conditions

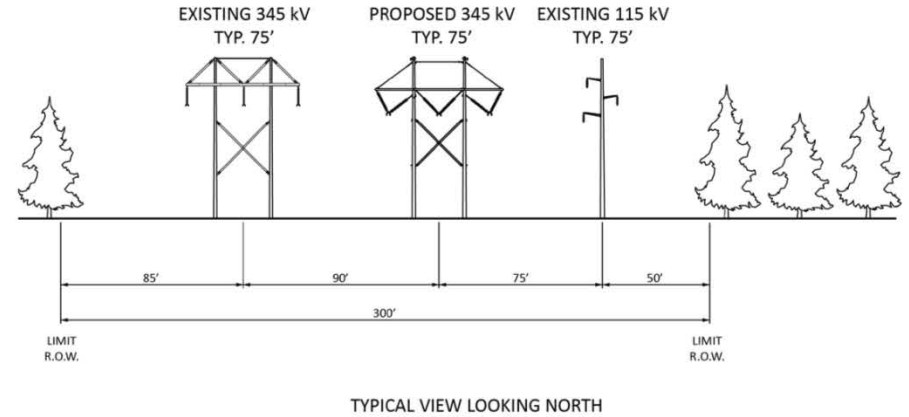




## Route 27, Wiscasset – Photosimulation



# Route 194, Whitefield





## Route 194 – Existing Conditions





## Route 194 – Photosimulation





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# End



**EXHIBIT CMP-5-C****Compilation of Methodology and Findings****SEGMENT 1:****CANADIAN BORDER TO MOXIE POND, NEW HVDC TRANSMISSION LINE****Existing Conditions**

Segment 1 includes 53.5 miles of HVDC transmission line within a new 150'-wide cleared corridor within a 300' right-of-way. The transmission line will be supported by single pole self-weathering steel structures with an average height of 100'. The corridor will be located in eleven unorganized townships (Beattie TWP, Lowelltown Twp, Skinner Twp, Appleton Twp, T5 R7 BKP WKR, Bradstreet TWP, Parlin Pond Twp, Johnson Mountain Twp, West Forks Twp, Moxie Gore, and The Forks Plt.) starting at the border with Quebec and running in an east-to-south direction to the north end of Moxie Pond in The Forks.

The Study Area of Segment 1 is mostly located within the Western Mountains Biophysical Region, a region characterized as a mountainous landscape with elevations ranging between 2,100' and 3,700'. The Study Area for Segment 1 includes 27 elevated viewpoints (hills and mountains) within 5 miles of the proposed corridor. Three named mountains will have views of the Project: Tumbledown Mountain in T5 R6, Number 5 Mountain in T5 R7, and Coburn Mountain in Upper Enchanted Twp.

The area within 3 miles of Segment 1 includes 33 small to medium sized water bodies, typically surrounded by spruce fir vegetation in heights ranging from 40' to 60'. Six of the ponds are rated for Scenic Resources in the Maine Wildlands Lake Assessment. Of these rated water bodies, three will have some views of the Project (Rock Pond, Fish Pond, and Parlin Pond).

The watershed of Segment 1 drains through small streams toward the East and West

Branches of the Moose River, the South Branch of the Moose River, the Moose River, and the Kennebec River. The northern portion of Segment 1 is drained by the Moose River and No. 5 Bog , which drains northward toward Attean Pond and then toward Moosehead Lake to the Kennebec River.

The predominant land use within Segment 1 is forestland that is actively harvested by commercial forest operations. Vegetation on the land immediately surrounding the Project is mixed deciduous and coniferous second growth with areas of active harvesting. Vegetation ranges in height from 0' (existing laydown areas) to 60'.

Residential development within the Study Area is limited to several seasonal camps on the lakes and ponds. The largest population centers near Segment 1 are the villages of West Forks and The Forks Plt, both approximately 5 miles from the Project. Jackman is over 8 miles to the north of the Project.

Over a dozen tracts of conservation land are found within three miles of Segment 1. The Project may be visible in varying degrees from elevated locations within five of these areas: Leuthold Preserve (The Nature Conservancy) (view from No. 5 Mountain); Upper Enchanted Twp Parcel (Bureau of Public Lands (BPL)) (view from Coburn Mountain); West Forks Parcels (BPL); Johnson Mountain Parcel (BPL); and Draper Parcel (New England Forestry Foundation).

### **Scenic Resources**

Scenic Resources in Segment 1 with potential views of the Project include: Beattie Pond in Beattie TWP; Wing Pond in Lowelltown Twp and Skinner Twp; Rock Pond in T5 R6 BKP WKR; Fish Pond in Hobbstown Twp; Parlin Pond in Parlin Pond Twp; Upper Kennebec River in West Forks Pl. and Moxie Gore; and Moxie Stream in Moxie Gore. Elevated viewpoints assessed include No. 5 Mountain in T5 R7 BKP WKR, Coburn Mountain in Upper Enchanted



Twp, and the Attean View Rest Area on Route 201 in Jackman.

**National Natural Landmarks (NNL) or Other Outstanding Natural Features**

The **No. 5 Bog and Jack Pine Stand** is an NNL located approximately 2 to 2.5 miles north of the Project in Attean Twp, TR R7 BKP WKR, and Bradstreet Twp. Project visibility will be extremely limited within the Bog due to the shoreline vegetation, water levels, and viewing distance.

**State or National Wildlife Refuge, Sanctuary, or Preserve or a State Game Refuge**

The **Leuthold Preserve** is a 16,934-acre forested preserve located north of the Project in Appleton Twp, T5 R7 BKP WKR, and Bradstreet Twp. The preserve is managed collaboratively by The Nature Conservancy, Forest Society of Maine, and the Maine Bureau of Parks and Lands as an ecological reserve. The Project will be visible from **No. 5 Mountain**, the only accessible elevated viewpoint within the Preserve, at a distance of 3.9 miles. At this distance the dark brown structures will be difficult to see against the wooded backdrop, but the two intersecting transmission corridors will be noticeable in the commercial forestland. The summit is fairly open with several large areas of exposed ledge with 360-degree views of the surrounding area. The view of the Project from the summit is partially screened by No. 6 Mountain, which is approximately 1 mile to the southwest. Photosimulation 4.

**State or Federal Trail.** Segment 1 will cross ITS 89 in Bradstreet Twp and Johnson Mountain Twp and ITS 87 in Johnson Mountain Twp. These ITS trails are part of The Forks Trail Network, a 150-mile series of snowmobile routes connecting Jackman, Eustis, Moosehead Lake, and Bingham. The majority of the ITS trails are generally located in the valleys on logging roads and should have minimal visual contact with the Project.

**Publicly Owned Land Visited, in Part, for the Use, Observation, Enjoyment, and Appreciation of Natural or Man-Made Visual Qualities.** The **Old Canada Road National**

**Scenic Byway** (Route 201) is designated as both a Maine State and a National Scenic Byway.

This 78.2 mile-long Byway follows the Kennebec River within Segments 1 and 2. It is also part of the Kennebec-Chaudiere Heritage Corridor, which links Fort Popham to the south with the City of Quebec to the north. The Project will be visible at four locations along the Byway.

To the southbound motorist, the first instance where the Project may be visible is at the **Attean View Rest Area** in Jackman, where Segment 1 will be located 7 to 12 miles to the southwest in an area characterized by the meandering Moose River and commercial timberland. This scenic overlook affords a 100-degree view toward Merrill Mountain, Attean Mountain, and Sally Mountain and Attean Pond, No. 5 Bog, and the Moose River. Wind turbines located 14 miles to the north in Canada are also visible. At this distance individual structures will not be readily visible to the average observer and the corridor clearing will blend with the surrounding vegetation patterns on either side of the corridor. There will be minimal to no visual impact from the Attean View Rest Area. Photosimulation 6.

To the southbound motorists, the Project will next appear in **Parlin Pond Twp.** as it crosses over the flank of Coburn Mountain. A field on the west side of Route 201 provides views of the mountain for approximately 15 seconds. During that period, viewers may see intermittent views of the Project in a transmission line that parallels the slopes of Coburn Mountain. A well-maintained farmstead with a very distinctive barn in the foreground is more likely to draw the attention than the Project in the midground. This view will not be seen by northbound motorists. Photosimulation 7.

The Project then crosses Route 201 in **Johnson Mountain TWP**, approximately 1,200'

south of Judd Road and 2,000' north of Capital Road. At this location the transmission corridor will pass through commercial forest land with mixed vegetation buffer strips 20 to 40' in height on both sides of the road, and a distribution line on the west side of the road. The most visible portion of the Project will be the conductors crossing over the road, which will be visible for approximately 1,900' (29 seconds) to southbound motorists. Northbound motorists may see the conductors and one of the structures for approximately one mile (one minute) approaching the crossing. Northbound motorists will see the conductors against a hillside that shows evidence of recent harvesting operations. There will be minimal visual impact to the Byway due to the minimal duration of view and limited Project visibility. Photosimulation 9.

The final point of visual contact is where the Project again crosses Route 201 just east of the **Wyman Dam** in Moscow (Segment 2). At this location the existing 225'-wide corridor containing other transmission lines will be widened by an additional 75' to accommodate the proposed HVDC transmission line. Photosimulation 19.

Based on the limited Project visibility, the distance between viewing opportunities, and its context in commercial timberland, the overall visual impact on the Old Canada Road Scenic Byway will be minimal.

**Coburn Mountain.** Upper Enchanted Twp Unit (also known as the Coburn Mountain lot) is a public lot managed by the Bureau of Parks and Lands. At elevation 3,730' it is the highest mountain in the region and a popular destination for snowmobilers. Some of the trails on the mountain follow portions of the abandoned Enchanted Mountain ski area that closed in the 1970's. The vegetation along the trail is generally 15-25' in height, which generally blocks any foreground views except for eastern views toward Indian Pond and Moosehead Lake. A large clearing on the summit contains a radio communications facility with a metal building,

communication infrastructure, solar panels, and a former fire tower. From the summit, there is an east to south vista with a filtered view of the northern portion of Moxie Pond. Recent clearing has increased the panoramic views from the summit. The old fire tower allows viewers to stand approximately 20' above the ground for a 360-degree view of the area.

The Project will first be visible near the trailhead in an area of active timber harvesting. From the summit, portions of the new 150' wide corridor clearing will be visible in the midground looking toward the west side of Johnson Mountain at distances of 1.2 to 3.0 miles and in the background (4+ miles) to the southeast. Up to 10 HVDC structures will be visible within 3 miles of the summit. Recreational users of trails on Coburn Mountain are aware of manmade structures along the trail and at the summit. The view from Coburn Mountain includes active commercial timber harvesting and haul roads, i.e., a characteristic working forest and not pristine wilderness. The 150' wide cleared corridor is sited within recently harvested areas to reduce additional tree removal.

To minimize the apparent width of the proposed transmission corridor, CMP is proposing to taper the vegetation within the corridor, maintaining trees and shrubs at the edges at heights ranging from 15 to 35 feet, rather than removing all woody vegetation. During initial clearing of the Project in these areas, CMP will retain capable vegetation outside of the wire zone up to 15 feet tall to facilitate future tapering that will allow capable vegetation up to 35 feet tall in areas outside of the wire zone. Capable vegetation will be selectively cut during periodic (every 4 years) routine maintenance cycles to remove individual specimens likely to either grow into the conductor safety zone prior to the next scheduled maintenance cycle, or likely to grow taller than the target heights prior to the next scheduled maintenance cycle. The overall effect is a softening of the cut profile as viewed from Coburn Mountain and the retention of vegetation of similar



color and texture as the surrounding landscape. The use of self-weathering steel structures and non-specular conductors will minimize the contrast with the wooded backdrop. The overall visual impact to the view from Coburn Mountain will be moderate. Photosimulation 8 and leaf-off views.

**Public Resource, such as the Atlantic Ocean, a Great Pond, or Navigable River.**

**Beattie Pond**, partially located in Beattie Twp and Lowelltown Twp., is classified by LUPC as a remote pond (Management Class VI). The Maine Wildlands Lake Assessment designated Beattie Pond as Resource Class 2: a lake of regional significance (with no outstanding values but at least one significant resource value). Fisheries were rated as ‘Significant’. Scenic resources were not considered unique or significant. Project views from the pond are limited to one angle structure located approximately 1,300 feet south of the Pond.

In the September 2017 original submission one of the angle structures appeared prominently visible above the horizon. By re-engineering this structure, the height has been reduced by approximately 39 feet. While a small portion of the top of the structure will still be visible above the treeline from a few areas on the pond, the structure will not appear above the skyline and will therefore be considerably less visually prominent, if it is noticeable at all. Re-engineering also was able to reduce the height of other structures. With the revised design, the tops of three structures and their shield wires will be visible just above the treeline, but will no longer be seen against the sky. The self-weathering steel used for the structures will minimize contrasts with the surrounding wooded hillside. Existing topography and shoreline vegetation will screen the rest of the Project from view. The re-engineered design will reduce the overall visual impact from the Pond and, as a result, the Project will be minimally noticeable from recreational users on the pond. Visual impact on the pond should be minimal to moderate.

Photosimulation 1.

**Wing Pond**, partially located within Lowelltown Twp and Skinner Twp, is classified by LUPC as a Management Class VI Lake, or remote pond. There are no roads within the P-RR buffer around the pond or camps on its shoreline. The Maine Wildlands Lake Assessment designated Wing Pond as Resource Class 3: a lake of local or unknown significance. Scenic resources were not considered unique or significant (i.e., they did not meet a minimum standard of significance).

Views of the Project from Wing Pond will include two structures and conductors seen at a distance of approximately 1.75 miles, located within a recently harvested area at the base of Smart Mountain. No additional corridor clearing will be required in the area visible from the pond. The self-weathering steel structure will minimize contrast in color with the surrounding vegetation. At certain times of the day and season, the conductors may be the most visible component when they reflect sunlight. Visual impact on Wing Pond should be minimal to moderate depending on viewers' location on the Pond. Photosimulation 2.

**Rock Pond** is a 124-acre waterbody in T5 R6 BKP WKR. The Maine Wildlands Lake Assessment designated Rock Pond as Resource Class 1B with 'Outstanding' Fisheries resources and 'Significant' Scenic and Shore Character resources. There is a boat launch, approximately 6 campsites on the northwestern end of the Pond, and one seasonal camp. The pond appears to have relatively heavy use, as evidenced by the number of boats stored at the boat launch. The camp sites on the northern end of the pond will not have views of the Project due to intervening vegetation. Visitors will cross under the transmission line as they drive along Spencer Road to access the pond. Up to six structures and the cleared corridor will be visible from the pond to the northwest at a distance of 3,500' as the line passes through the valley

between Three Slide and Greenlaw mountains. Additionally, the top portions of up to six structures, conductors, and portions of the cleared corridor will be visible to the north at distances of 0.6 to 0.8 mile.

The initial photosimulation indicated that the clearing required for the proposed transmission corridor would cause significant contrast in color, form, line, and texture within a small part of the view looking northwest from the pond. After developing and evaluating several alternatives, CMP is proposing to taper the vegetation within the transmission corridor, maintaining trees and shrubs at the edges of the corridor at heights ranging from 15 to 35 feet, rather than removing all woody vegetation. During initial clearing of the Project in these areas, CMP will retain capable vegetation outside of the wire zone up to 15 feet tall to facilitate future tapering that will allow capable vegetation up to 35 feet tall in areas outside of the wire zone. Capable vegetation will be selectively cut during periodic (every 4 years) routine maintenance cycles to remove individual specimens likely to either grow into the conductor safety zone prior to the next scheduled maintenance cycle, or likely to grow taller than the target heights prior to the next scheduled maintenance cycle. The overall effect is a softening of the cut profile as viewed from Rock Pond and the retention of vegetation of similar color and texture as the surrounding landscape. Shoreline vegetation will partially screen the closest visible structures; the use of self-weathering steel structures and non-specular conductors will minimize the contrast with the wooded backdrop. The visual impact to Rock Pond will be moderate, and not unreasonable. Photosimulation 3.

**Fish Pond** is a 219 acre waterbody in Hobbstown Twp. The Maine Wildlands Lake Assessment designated Fish Pond as Resource Class 2 with 'Significant' resource ratings for Scenic and Cultural resources. Recreational resources include a boat launch on the northwestern

end of the pond adjacent to a small campground. The shoreline appears undeveloped and the focal points on the Pond are No. 6 Mountain and No. 5 Mountain. Project visibility will be very limited, with the tips of up to 4 structures slightly visible above the treeline at distances of 3 to 4 miles. The corridor clearing will not be visible. The visual impact to Fish Pond will be minimal. Photosimulation 5.

**Parlin Pond** is a 543 acre waterbody in Parlin Pond Twp. that receives heavy recreational use. The Maine Wildlands Lake Assessment designated Parlin Pond as Resource Class 1B with 'Significant' ratings for Fisheries, Scenic and Shore Character, and Botanical resources. Up to five transmission structures will be visible from the northern and eastern portions of the pond at distances of approximately 1.8 to 2.8 miles as the corridor ascends the shoulder of Coburn Mountain. The transmission line will appear as a relatively faint change in color below the ridgeline; the cleared corridor itself will not be visible from the pond. One of the structures will be seen against the sky; the remaining dark brown structures will be seen against the wooded slopes of Coburn Mountain. The visual impact to Parlin Pond will be minimal to moderate, and not unreasonable. Photosimulation 7.

**Upper Kennebec River.** Segment 1 will go under the Upper Kennebec River in West Forks Plt and Moxie Gore at a point approximately 8.2 miles downriver from the Harris Dam. The Maine Rivers Study identifies the Upper Kennebec River as an "A" river, with unique/significant resource values for undeveloped, scenic, and inland fisheries. This section of the River is also rated as having outstanding statewide geologic and whitewater boating resource values with high recreational importance. The River itself is zoned as a Protected Recreation Resource Subdistrict by LUPC. The river is a recreational resource used by whitewater rafters / kayakers and anglers. Locating the Project underground will fully preserve the aesthetic



character of this section of the Upper Kennebec River by eliminating views of an overhead transmission line and warning balls that would have been visible to recreational users of the river.

**Moxie Stream** is a tributary of the Upper Kennebec River from its headwaters at Moxie Pond and is rated as an “A” river in the Maine Rivers Study. The stream is rated for its Geologic/Hydrologic, Critical/Ecologic, Undeveloped, and Scenic Resource Values. Segment 1 will cross Moxie Stream in Moxie Gore approximately 2.3± miles north of the confluence with the Kennebec River. The 150’ wide corridor and conductors will be visible for approximately 760’ on the upstream side and approximately 1,000’ on the downstream side of the crossing. Avian marker balls may be installed on shield wires and conductors. The transmission structures will be set back 410’ from the stream on the north side, and 560’ on the south side. Riparian vegetation along the stream bank will be preserved and will minimize views into the corridor from the stream. The visual impact to Moxie Stream will be minimal based on the limited duration of exposure and the screening effects of preserved riparian vegetation. Photosimulation

12.

**The Moose River.** While not rated as a scenic river segment in the Maine River Study, the 34-mile Bow River Trip between Attean and Holeb Ponds in Jackman is a popular recreation resource. Approximately 7.2 miles of the river are located within 3 miles of the Project. Field work and computer analysis have determined that Project visibility would be very limited to none, due to riparian vegetation.

**South Branch Moose River,** Skinner Twp (not rated as a scenic river segment). The Project will cross in a location where the river is 70’ wide within a wooded strip between logging roads. The closest HVDC structures will be 775’± to the east and 575’± to the west, in close

proximity to the logging roads. Preserved riparian vegetation will minimize views into the corridor. The visual impact to South Branch Moose River will be moderate, and not unreasonable.

## **SEGMENT 2: MOXIE POND TO WYMAN HYDRO**

**Segment 2** includes the northern portion (22± miles) of a HVDC transmission line that will be co-located within an existing 115kV transmission corridor from the southern end of Segment 1 through Caratunk and Bald Mountain TWP to the Wyman Hydroelectric Facility in Moscow. In most of this segment, the existing 150' wide corridor clearing will be increased by 75' on the western side. Segment 2 will be located on the west side of Moxie Pond and cross the Appalachian Trail in the vicinity of Joe's Hole in the existing 115 kV corridor. The northern portion of Segment 2 will be supported by single pole self-weathering steel structures ranging from 75' to 105 in height. The structures on the southern portion of Segment 2 will be single pole self-weathering steel structures with an average height of 100'.

The Study Area of Segment 2 is located within the Central Mountains Biophysical Region and is characterized by medium to large waterbodies surrounded by mountains with elevations ranging between 1,630' and 2,630'. Seven mountains are found within 5 miles of the Project: Black Nubble in Squaretown TWP; Bald Mountain in Bald Mtn. TWP; Mosquito Mountain, Pleasant Pond Mountain, and Middle Mountain in The Forks; and Moxie Mountain and Black Nubble in Caratunk.

The two largest water bodies are Moxie Pond (2,370 acres) on the north end of Segment 2 and Wyman Lake (3,200-acre impoundment) at the south end. Moxie Pond is rated outstanding in the Maine Wildlands Lakes Assessment; Wyman Lake is rated significant. The

Study Area also includes 12 small to medium water bodies typically surrounded by spruce/fir forest averaging 60' to 75' in height and commercially harvested areas. Mosquito Pond in The Forks (71 acres) is rated outstanding in the Lakes Assessment. Moxie Pond, and Wyman Lake will have varying degrees of Project visibility. The Project will not be visible from Mosquito Pond.

Predominant land uses in the immediate vicinity of the co-located transmission line includes commercial forestry operations, seasonal camps on adjacent ponds, and the former Moscow radar site. The most significant conservation parcel is the Appalachian Scenic Trail located in Bald Mountain TWP and Caratunk. The largest population center is the village of Moscow at the southern end of Segment 2.

### **Scenic Resources**

Scenic Resources with potential views of the Project that were evaluated include: Moxie Pond, the Appalachian Trail (including the summits of Pleasant Pond Mountain and Bald Mountain, and the existing transmission line crossing at Troutdale Road, Joe's Hole/Baker Stream), the Wyman Lake Recreation Area, the Arnold Trail, and Wyman Lake. Two additional locations were evaluated: Mosquito Mountain in The Forks Plt and Moxie Mountain in Caratunk. Both mountains are privately owned and allow public access.

**State or Federal Trail.** Approximately 14.5 miles of the **Appalachian National Scenic Trail** (AT) are located within 5 miles of Segment 2. There would be three general areas of Project visibility from the AT: 1) from the summit of Pleasant Pond Mountain at distances of 2.9 to 6.5± miles, 2) from the 115kV transmission line crossings near Troutdale Road on Moxie Pond, and 3) from the summit of Bald Mountain, including the North Peak side trail, at distances of 2.8 to 6.5± miles.

**Pleasant Pond Mountain.** The summit of Pleasant Pond Mountain (elev. 2,477) is 3.3 miles from the Project and offers 180+ degree views north to east of Moxie Pond to Mount Kineo, Mount Katahdin, and many other peaks. Moxie Pond and Mosquito Mountain are visible in the midground and Bald Mountain in the background. The Bingham Wind Project is partially visible 13 miles to the southeast. The existing 115kV transmission line, located along the western shore of Moxie Pond, is not highly visible from the summit due to intervening vegetation along the edge of the cleared corridor.

Approximately 250 feet south of the summit is another viewpoint with less obstructed views and a 270-degree view from north to south. From this viewpoint the proposed co-located HVDC transmission corridor will be visible at distances of up to 6+ miles to the southeast. Portions of the co-located HVDC line will be screened by Mosquito Mountain to the northeast and Middle Mountain to the southeast. The closest visible structures will be minimally visible with just tips visible at distances of 2.9 to 3.5 miles. The majority of proposed HVDC structures will be screened by vegetation. There would be potential for up to 12 structures to be visible looking to the southeast at a distance of 4.5 to 6.5 miles but the structures will be difficult to distinguish from the background. The new HVDC transmission line (Segment 1) will be 5.4+ miles to the northeast and minimally visible. The visual impact to the AT on Pleasant Pond Mountain will be minimal, due to topographic screening, the viewing distance, and the use of self-weathering steel structures. Photosimulation 18A.

**Middle Mountain.** The view from Middle Mountain (elev. 2,300') is more filtered than the view from Pleasant Pond Mountain, immediately to the north, due to its lower elevation and the height of the spruce/fir vegetation. The existing transmission line is difficult to distinguish from this point. The Project would be mostly screened by foreground vegetation. Up to 3



structures would be visible, with the closest 2.7 miles to the east. The visual impact to the AT on Middle Mountain will be minimal, due to vegetative and topographic screening and the viewing distance.

**Corridor Crossings.** Southbound hikers will next encounter the Project near Moxie Pond approximately 4.7 miles from the summit of Pleasant Pond Mountain, where the trail will eventually cross the transmission corridor in three locations. The AT first crosses the existing 115kV corridor approximately 500' west of Troutdale Road where 12+ existing transmission structures within the 150' wide cleared corridor are visible over approximately 400' of trail. Once the AT reaches Troutdale Road, it parallels the road for approximately 900' before crossing Baker Stream and heading to Bald Mountain. The existing transmission corridor is visible for approximately 400' as it crosses over Troutdale Road. Hikers on Troutdale Road see five existing transmission line structures to the southeast and two to the northwest. A small trailhead off Troutdale Road has parking for 3 cars and a small campsite.

The existing 150' wide 115kV transmission clearing will be widened by 75' on the west side to accommodate the new HVDC transmission line. The widened corridor will slightly increase the time that hikers spend crossing the transmission line in each of these two locations. From both AT crossings, two self-weathering steel HVDC structures will be visible looking to the northwest and six to the southeast. Structure heights will range from 80' on either side of Joe's Hole up to 105' for the angle structures furthest from view in either direction. The structures closest to Troutdale Road will be set back 420' to 500' from the road. Structures will be spaced approximately 800' to 900' apart, compared to the 375' to 570' spacing for existing structures. The visual impact on the AT will be moderate due to the presence of the existing 115kV transmission line corridor, the developed context, and limited viewing time.

Photosimulation 18B.

After walking along Troutdale Road, hikers leave the road and head east to reach Bald Mountain requiring the immediate crossing of Baker Stream at the south end of Joe's Hole. The trail continues for 1,400' after the stream to the third transmission line crossing. The trail parallels the existing corridor for approximately 75 feet before it crosses at a nearly perpendicular angle. Within the corridor hikers see 7 transmission structures to the northwest and 8 to the southeast.

With the additional corridor clearing, an additional 425' of the AT would be within the clearing (290± of the trail is currently within the clearing). At this point hikers would see one HVDC transmission line structure looking to the northwest and six looking to the southeast. The visual impact to the trail will be moderate due to the presence of the existing 115kV transmission line corridor, foreground viewing distances, and the limited viewing time within the corridor.

**Bald Mountain.** The summit of (Moxie) Bald Mountain (elev. 2,629') is 3.0 miles from the Project and approximately 5 trail miles east of Troutdale Road. The summit landscape consists of open exposed ledge areas with patches of 5-10 foot spruce/fir vegetation. This open summit provides a 360-degree view of the surrounding landscape, which includes the Bigelow Range, Coburn Mountain, Pleasant Mountain, Mosquito Mountain, and the northern half of Moxie Pond. The closest portions of the existing 115kV transmission line are screened by vegetation and not readily visible from the summit. The most visible portion of the existing transmission line is the cleared corridor near the northern end of Moxie Pond at a distance of 5.1 miles.

From Bald Mountain, only the co-located section of the HVDC transmission line would be visible; the new HVDC transmission line will not be visible more than 8 miles to the

northwest. At the closest point, the co-located corridor will be partially visible at a distance of 2.8 miles. The majority of the Project looking southwest will be screened by low spruce/fir trees along the perimeter of the open summit area. The focal point looking southwest is Baker Pond and Moxie Mountain and background mountains. The Project will not interfere with the view towards those landscape elements. Looking to the west and northwest, the Project will be located along the west side of Moxie Pond, which is partially screened by foreground vegetation. The only place a hiker will see the widened corridor clearing is where the existing corridor is visible at a distance of 5.1 miles. The self-weathering steel HVDC structures will blend with the wooded backdrop. The conductors will be the most visible components of the Project, especially in the morning hours when the sunlight is reflecting off the lines. Due to the partial screening of the Project and viewing distance, there will be a minimal visual impact from the summit of Bald Mountain. Photosimulation C.

**Snowmobile trails.** The co-located HVDC transmission line corridor will run parallel to and cross ITS 86 in The Forks Plt for approximately one mile. The existing 115kV transmission line corridor will be expanded by 75' on the western side. The visual impact to the ITS trail should be minimal due to the trail's current location within the corridor.

**Public Site or Structure Listed on the National Register of Historic Places.**

Approximately 3 miles of the **Arnold Trail Historic District** is located along the centerline of Wyman Lake from the dam north within the Segment 2 Study Area. The more culturally significant locations (e.g., Great Carrying Place Portage Trail) of the Arnold Trail are not within the Segment 2 Project area. Three HVDC transmission structures and conductors will be visible at distances of 0.5 - 1.3 miles from the middle of Wyman Lake where the Arnold Trail is located, and seen in context of the Wyman Hydroelectric Dam and the Bingham Wind project. There will

be a minimal visual impact from the Arnold Trail. Photosimulation 20.

**Municipal Park or Public Open Space.** The **Wyman Lake Recreation Area** in Pleasant Ridge Plt is managed by Brookfield Renewables and the Bingham-Moscow Chamber of Commerce. The area includes a boat launch, swimming beach, picnic areas, and rest rooms. The Project will be visible from the swimming beach adjacent to the existing 115kV transmission line corridor and will be seen in context with the Wyman Hydroelectric Dam and portions of six recently installed Bingham Wind turbines. Three HVDC transmission structures and conductors will be visible at distances of 0.9 - 1.3 miles from the beach. There will be a minimal visual impact to the Wyman Lake Recreation Area.

**Public Resource, such as the Atlantic Ocean, a Great Pond, or Navigable River.**  
**Moxie Pond** is a 2,370 acre waterbody in East Moxie Twp, The Forks Plt., and Bald Mountain Twp. The Maine Wildlands Lakes Assessment designated Moxie Pond as Resource Class 1B with ‘Outstanding’ Scenic resources and ‘Significant’ Fisheries, Shore Character, and Cultural resources. The Scenic Lakes Character Evaluation in Maine’s Unorganized Towns characterized Moxie Pond as “High” for Inharmonious Development.

The pond has a boat launch at its northwest end near the dam, approximately 145 camps on the west side, and 30± camps on the east side. The main access road for the camps is Lake Moxie Road/Troutdale Road, which runs along the shoreline, parallel to the existing 115kV transmission line on the western side of the pond. The majority of the camps on the western shoreline are oriented to the east and away from the transmission corridor. The existing 115kV wooden H-frame structures are typically 45’ in height and spaced 350’ to 500’ apart. The existing transmission line is generally 350’ to 900’ from the edge of the pond, except for a few areas such as near Caribou Narrows, Black Narrows, and Joe’s Hole at the southern end. The



existing transmission line is generally not visible from the pond.

The existing 150' wide corridor clearing will be widened by 75' on the western side (away from the Pond) to accommodate the new transmission line. The structures will range in height from 75' to 105'. Of the 36 proposed HVDC structures that would be installed in this area, the tops of approximately 12 structures would be visible from various areas of the pond; the majority of the structures and conductors will be screened by shoreline vegetation, which averages 60 to 75' in height. Portions of the cleared corridor will be visible in two areas where the existing corridor is already visible: at the southern end north of Joe's Hole and near Black Narrows. From the northern end of the pond, near the boat launch, the tips of six HVDC structures and portions of conductors will be visible at distances of 2,400' to 4,200'. From the southern end of the pond, the tops of up to three HVDC transmission line structures and conductors will be visible above the tree line, seen in context with the two existing H-frame structures and their conductors. The use of self-weathering steel structures will minimize the contrast with the wooded backdrop as seen from the pond. The visual impact to Moxie Pond will be minimal due to the presence of the existing transmission line and the screening effects of shoreline vegetation. Photosimulations 14 and 15.

**Wyman Lake** is the only portion of the Kennebec River where Segment 2 would be visible. The lake is not considered to have scenic resources by the Maine Wildlands Lakes Assessment. The Wyman Dam was constructed in 1931 for hydroelectric generation. Wyman Lake, the resultant impoundment, extends for 11 miles to the north. Several recreation facilities have been constructed along the shoreline for boat access, swimming, and picnicking. Boaters and swimmers using the southern 3 miles of the lake currently see the dam, existing transmission lines, camps, Pleasant Ridge Road, and 6 turbines of the Bingham Wind Project. Approximately

three HVDC transmission structures and conductors will be visible at distances of 0.5 - 1.3 miles from the southern portion of the lake. The Project will have minimal visual impact on Wyman Lake.

**Baker Stream**, in Bald Mountain Twp T2 R3, flows from Baker Pond to Moxie Pond. The existing 115kV transmission line crosses Baker Stream just south of Joe's Hole. The Appalachian Trail crosses Baker Stream in a ford, approximately 500' south of the transmission line crossing. Troutdale/Trestle Road is located on the west side of Baker Stream and crosses just north of Baker Pond. There are five camps on the west side of the stream. The existing 150' wide corridor clearing will be widened by 75' on the southern side at the stream crossing to accommodate the new HVDC transmission line. The preserved vegetation along the stream will continue to screen the Project from view for the majority of the stream. The visual impact to Baker Stream will be minimized due to the presence of the existing transmission line and the screening afforded by riparian vegetation.

### **SEGMENT 3: CO-LOCATED HVDC FROM MOSCOW TO LEWISTON**

**Segment 3** will include 70± miles of co-located HVDC transmission line from the Wyman Hydroelectric Facility in Moscow to the new Merrill Road Converter Station, just north of Larrabee Road Substation in Lewiston. The existing corridor clearing ranges between 150' and 225' in width for the majority of Segment 3; the exception is a 400' wide 1.1-mile long section ending at the Livermore Falls Substation. The co-located section will require the existing cleared corridor to be widened by 75' on the western side. The Project will include a new 1.2-mile 345 kV line to connect the Converter Station and Larrabee Road Substation; a partial rebuild of 0.8 mile of 34.5kV transmission line to accommodate the connecting segment; and the

installation of a new 345kV transmission line terminal. Segment 3 will be comprised of single pole self-weathering steel structures with an average height of 100'.

The northern portion of Segment 3 is located in the Central Mountains and Western Foothills Biophysical Regions and is part of the Kennebec River and Sandy River watersheds, with numerous small to medium waterbodies ranging in size from 6 to 196 acres. There are also a few larger water bodies: Embden Pond (1,568 ac) in Embden and Clearwater Pond (751 ac) in Industry. The area is surrounded by hills and mountains with elevations ranging between 1,200' and 1,850'. This portion of the Study Area includes Bingham, Concord Plt, Embden, Solon, Anson, Madison, Starks, Industry, Farmington, New Sharon, Wilton, and Chesterville. The Kennebec River flows for 27 miles through the northern portion of Segment 3 with several population centers located along its banks. The Project will be located within an existing 115kV transmission line corridor which is 0.25 to 1.5 miles west of the Kennebec River. The Sandy River flows through Farmington and the central portion of the Study Area toward the Kennebec River.

The southern portion of the Segment 3 Study Area is within the Western Foothills Biophysical Region and is part of the Androscoggin River watershed, with small to medium water bodies generally ranging in size from 3 to 208 acres, and medium-sized hills with elevations ranging between 665' and 1,116'. The largest waterbodies in the APE are Androscoggin Lake (3,980 acres) and Lake Auburn (2,260 acres). The southern portion of Segment 3 includes the Towns of Jay, Livermore Falls, Leeds, Greene, and Lewiston. The largest population center is Lewiston.

The Androscoggin River flows for 41 miles through the southern portion of the Study Area and is crossed by the Project in Auburn. The Project will be located within an existing

115kV transmission corridor that is 0.7 to 1.8 miles east of the Androscoggin River.

The majority of the land cover immediately surrounding Segment 3 is mixed forestland with occasional agricultural fields. The existing transmission line is predominantly edged with 50 to 70-foot tall mixed deciduous and evergreen trees. Land use in the immediate vicinity of the transmission line is a mix of woodland, farmland, and low density rural residential with clusters of village development.

**Scenic Resources.** Scenic Resources with potential views of the Project include the Lower Kennebec River and Arnold Trail from Moscow to Norridgewock; Fahi Pond Wildlife Management Area in Embden; the Carrabassett River in Anson; the Sandy River in Farmington; the Dead River in Leeds; Allen and Berry Pond in Greene; and the Androscoggin Riverlands State Park in Leeds and Turner. Monument Hill in Leeds was evaluated as the one elevated viewpoint with potential Project views.

**State or National Wildlife Refuge, Sanctuary, or Preserve or a State Game Refuge**  
There are three Wildlife Management Areas (WMA) within the Segment 3 Study Area: Fahi Pond WMA in Embden, Tolla Wolla WMA in Livermore, and Chesterville WMA in Chesterville. Fieldwork and computer modeling have confirmed that none of these WMAs will have views of the Project due to intervening vegetation.

**State or Federal Trail.** The 14.5-mile Kennebec Valley Trail follows the edge of the Kennebec River from North Anson through Embden and Solon to Bingham. The multi-use trail allows ATV's, snowmobiles, horseback riding, hiking, cross country skiing and biking. The trail currently crosses an existing 115kV transmission line in North Anson to the east of the Carrabec High School playing fields. The proposed widening of the corridor will increase the duration of exposure for users but the overall visual change will be minimal.



The Arnold Trail, as noted in Segment 2, follows the Kennebec River through Segment 3. The only location where the Project will be visible from the Arnold Trail is at the point where it crosses the Lower Kennebec River, directly below the Wyman Hydroelectric Dam. Visitors will experience the Project in the context of the Wyman Dam, the substation, and numerous transmission lines. The visual impact to the Trail should be minimal due to the industrial nature of the site.

Segment 3 is crossed or paralleled by four ITS snowmobile trails: ITS 84 in Anson on the Kennebec Valley Trail, ITS 82 and ITS 115 in Jay, and ITS 87 in Leeds as well as within the corridor between Livermore Falls and Lewiston. Snowmobilers are accustomed to seeing the existing transmission line corridor. There will be minimal visual impact to the ITS trails.

**National or State Park. Androscoggin Riverlands** is a 2,675-acre state park located in Leeds and Turner with 12 miles of frontage on the Androscoggin River. Riverlands is split into two parcels: 2,345 acres on the west side of the river in Turner, and 330 acres on the east side of the river in Leeds. The park includes a wide variety of trails for different users including skiers and snowmobilers in the winter and ATVs, pedestrian hikers, mountain bikers, and horseback riders in the other seasons. Hunting is also allowed within the Park. The park and river are part of the Androscoggin Greenway and Androscoggin River Water Trails, with numerous boat access points along the riverfront within the Park.

The pedestrian trails in the Turner parcel closest to the shoreline include remnants of several old homesteads, water access locations, a picnic area, and several overlooks. There will be no views of the Project from the trails or riverfront overlooks on the west side of the river.

The Leeds parcel is less developed with less formal boat access. An existing 115kV transmission line crosses the Leeds parcel for approximately 0.6 mile west of Church Hill Road.

The relatively flat topography allows for distant views into the corridors in both directions. Vegetation edging the corridor is mixed evergreen and deciduous at heights ranging from 50' to 70'. The corridor contains one 115kV transmission line supported on wood H-frame structures typically 45' in height and one 115kV transmission line supported on single pole wood structures typically 75' in height. The existing 225' corridor clearing will be widened by 75' on the western side to accommodate the proposed co-located HVDC transmission line. Widening the corridor will not make the corridor visible from the river. The proposed HVDC structures will be typically 100' in height and spaced approximately 1,000' apart. Visitors to this portion of the State Park expect to see the transmission line and may even use the Project corridor for some recreation pursuits, e.g., snowmobiling, ATV riding, and hunting. Though there will be a moderate contrast in material, color, and structure height, the visual impact to the State Park will be minimal due to the presence of the existing transmission lines. See Photosimulation 23.

**Municipal Park or Public Open Space.** The only municipal parcel that will have views of Segment 3 will be the **Carrabec High School athletic fields** on the west side of the existing corridor in Anson. The Kennebec Valley Trail runs along the northern edge of the fields and crosses the existing transmission line about 800' north of the Route 8 crossing. The existing 115kV transmission lines are currently visible across the street over a field to the southeast. Currently there is a 150' to 250' wide mixed evergreen/deciduous vegetative buffer between the fields and the existing corridor that screens the views of the transmission lines. The existing 225' cleared corridor will be widened by 75' on the western side to accommodate the proposed co-located HVDC transmission line, decreasing the buffer to 75' to 175' in width. The proposed structures will be typically 100' in height and spaced approximately 1,000' apart. The tip of one structure will be visible above the tree line from the athletic fields and one will be visible south

of Route 8 over the open fields. The visual impact on the athletic fields will be minimal due to the limited amount of structures visible and the remaining vegetative buffer. Photosimulation 21.

**Publicly Owned Land Visited, in Part, for the Use, Observation, Enjoyment, and Appreciation of Natural or Man-Made Visual Qualities. Monument Hill,** located in Leeds, is a popular short hike to a summit (elev. 665') where a Civil War monument is located. Views from the top look to the east over Androscoggin Lake and to the west toward existing transmission lines 1.5 miles to the west. The existing 115kV transmission line corridor is not readily visible due to intervening vegetation and topography. With the widening of the corridor, the tips of a few proposed HVDC structures may be slightly visible against the wooded backdrop, where their dark brown color will blend with the background vegetation. The widened corridor will be minimally visible and appear similarly to the existing openings. The visual impact to Monument Hill will be minimal.

**Public Resource, such as the Atlantic Ocean, a Great Pond, or Navigable River**  
**Lower Kennebec River.** The Project will cross the Lower Kennebec River south of Wyman Hydroelectric Dam. The existing 150' corridor clearing will be widened by 75' on the western side to accommodate the co-located HVDC transmission line. At this location, viewers also see the Wyman dam, substation, and existing transmission line. The Kennebec River in this area has restricted access due to the potential for rapid water level rise. The visual impact to a viewer in this area will be minimal to none. The lower portion of the **Kennebec River** between Madison and The Forks is rated as a "B" river in the Maine Rivers Study. The section of river between the headwater to the Kennebec River is rated for its Geologic/Hydrologic, Critical/Ecologic, Scenic, Inland Fisheries, Canoe Touring and Historic Resources. The viewshed analysis indicates a potential for Project views in several locations along the 27 miles of the river within the Segment

3 Study Area. This analysis conservatively assumes a maximum 40' tree height to determine visibility. Field work and 3D Modeling has concluded that the vegetation along the river in most locations is taller than 40' and will screen the Project from view. In some isolated areas, such as near the confluence of the Carrabassett River, portions of the proposed HVDC structures may be visible where the riparian vegetation is below 40' in height.

The **Carrabassett River** is a "B" rated river in the Maine Rivers Study. The section of the river between the headwater to the Kennebec River is rated for its Geologic/Hydrologic, Critical/Ecologic, Inland Fishery, Whitewater Boating, Canoe Touring and Historic Resources. While the river is not ranked for Scenic resources, the Study notes that North Anson Gorge has been identified as 'Significant' by the Critical Areas Program because of its scenic and scientific attributes. The Project will cross the Carrabassett River 0.5 mile downstream of the Route 8 bridge on the western side of the existing transmission line crossing in a relatively flat landscape where the river is 450'± wide. The existing 225' corridor clearing will be widened by 75' on the western side to accommodate the proposed transmission line. The proposed structures on either side of the river will be set back 270' on the north side and 223' on the south side, which is similar to or greater than the existing structures. The existing vegetation on either side of the corridor will partially screen the structures from view when approaching the corridor crossing. The Project will not be visible from the North Anson Gorge or from the Route 8 bridge due to intervening topography and vegetation. There will be minimal visual impact to users of the Carrabassett River due to the presence of the existing transmission line and screening effects of preserved riparian vegetation.

The existing transmission line corridor crosses **Sandy River** in Farmington southwest of Route 2. The Maine Lakes Study determined that the scenic resources of this section of Sandy



River were not unique or significant. (The Sandy River from Phillips to the headwaters - not within the Study Area - is rated for scenic resources.) The AMC River Guide: Maine describes the area of the crossing as “smooth and winding” with scenery of rural land use with towns. Agricultural fields line the riverfront, separated by a band of riparian vegetation along the banks. The existing corridor is partially buffered except within the corridor. The existing conductors are visible for approximately 0.3 mile heading southeast downstream, and 0.25 mile looking to the northwest after the crossing.

The 225'-wide cleared corridor will be expanded by 75' on the western side to accommodate the new transmission line. In the open fields the expanded corridor clearings may appear to be extended agricultural fields to those on the river. Approximately five proposed HVDC structures and conductors will be visible at the river crossing along with 10± existing H-frame 115kV structures. The closest proposed HVDC structure will be 150' from the edge of the river, set back further than the existing 115 kV structures. Visual impact on the Sandy River will be minimal due the presence of the existing transmission line and existing openings on both sides of the river. Photosimulation 23.

The Project will be visible from the **Dead River** in Leeds within the existing cleared transmission line corridor. There is an approximately 125'± long suspension bridge for ITS 87 across this section of river. The existing 225' wide cleared corridor will be widened by 75' on the western side to accommodate the new HVDC transmission line. There will be minimal visual impact to the river, due to the presence of the existing transmission line and the preserved riparian vegetation.

Two ponds in Greene may have views of the Project because of their close proximity to the existing transmission corridor. **Allen Pond** is a 183 acre highly developed waterbody

approximately 250 feet east of the existing corridor. Recreational users may see 5 to 6 HVDC structures above the treeline. **Berry Pond** is a 31-acre undeveloped waterbody 1,800'± west of the existing corridor. Recreational users may see up to up to 2 structures. The visual impact on two ponds will be minimal to moderate depending on the viewer's location.

#### **SEGMENT 4: REBUILD OF SECTIONS 62 AND 64, LEWISTON TO POWNAL**

**Segment 4**, a rebuild of Sections 62 and 64, will include a new 345kV Substation off Fickett Road in Pownal and a 0.3 mile 345kV AC Transmission Line that will connect this facility to the Surowiec Substation in Pownal. In addition, two 115kV transmission lines will be rebuilt: a 9.3 mile section between Crowley's Substation in Lewiston and Surowiec Substation in Pownal, and a 16.1 mile segment between Larrabee Road Substation and Surowiec Substation. The typical 45' wooden H-frame structures will be replaced with 75' wooden single pole structures. The rebuilt sections are located in Lewiston, Auburn, Durham, and Pownal.

The area within one mile of Segment 4 is characterized by low rolling hills with average elevations of 100 to 350 feet above the surrounding landscape. Watersheds drain toward the No Name River, Sabattus River, and the Androscoggin River. The vegetation is predominantly mixed evergreen and deciduous second growth. The existing transmission line is edged with a mixture of light mixed hardwoods and stands of 50 to 70-foot tall evergreen trees. Land use in the immediate vicinity of the transmission line is predominantly woodland, farmland, and low to medium density rural residential. Downtown Lewiston is 0.5 mile to the west; Durham village is 3.0± miles to the southeast; New Gloucester is 4.2± miles to the west; and North Pownal is approximately 0.5 mile to the east.

**Scenic Resources.** Scenic Resources with potential views of the Project include the

Androscoggin River crossing in Auburn and No Name Pond in Lewiston.

**Public Resource, such as the Atlantic Ocean, a Great Pond, or Navigable River**

The Durham Boat Launch on the **Androscoggin River** in Durham is located 0.6 mile to the southeast of the Project. Views of the Project from the riverfront would be screened by a hedgerow of evergreen trees and existing riparian vegetation.

The proposed Rebuilt Sections 62 and 64 crosses the **Androscoggin River** between Lewiston and Auburn, adjacent to Riverside Drive/Route 136. The section of the Androscoggin River where Segment 4 crosses was not rated as scenic by the Maine Rivers Study. The existing wooden H-frame structures on the either side of the river crossing will be replaced with single pole self-weathering steel structures. The rebuilt section will be supported by single pole wooden structures typically 75' in height. No additional tree removal will be necessary. There will be minimal additional visual impact due to the presence of the existing 345kV transmission line and 115kV transmission lines. Photosimulation 25.

**No Name Pond** in Lewiston is a 143-acre pond located approximately 0.3 mile from Segment 4. It is not rated in Maine's Finest Lakes. The pond is lightly developed with public access on the north end. From the pond, up to 7 structures and conductors may be visible above the treeline looking to the southwest at a distance of 1.6 miles.

## **SEGMENT 5**

**Segment 5** will include a new 26.5-mile 345kV AC transmission line from the existing Coopers Mills Substation in Windsor to the existing Maine Yankee Substation in Wiscasset; partial rebuild of a 0.3 mile segment of the 345kV transmission line between Larrabee Road Substation and Coopers Mills Substation; partial rebuild a 0.8 mile segment of 345kV

transmission line between Maine Yankee Substation and Coopers Mills Substation; approximately 3 miles of re-conductor work on existing double circuit lattice steel towers outside of Maine Yankee; and a partial rebuild of a 0.8 mile segment 115kV transmission line outside of Coopers Mills Substation. Segment 5 is located in Windsor, Whitefield, Alna, Woolwich, and Wiscasset.

The northern portion of Segment 5 (0.7 mile $\pm$ ) will be located between four existing 115kV transmission lines and two existing 345kV transmission lines near Cooper's Mills Substation. The majority of the co-located 345kV transmission line will be located between an existing 115kV transmission line supported on wooden single pole structures typically 75' in height and one existing 345kV transmission line supported by wooden H-frame structures typically 75' in height. The southernmost section (2.9 miles $\pm$ ) from the Maine Yankee Substation crossing Route 1 and Montsweag Brook in Wiscasset includes two or three steel lattice structures, typically 125' in height. The co-located 345kV structure will be supported by wooden H-frame structures typically 75' in height, similar to the existing 345kV structures except for the southern section, which will be supported on existing steel double-circuit lattice structures.

The typical corridor clearing width in the northern section is currently 575' to 640' in width; the majority of the corridor ranges from 300' to 480' in width; the southern section closest to Maine Yankee has a cleared corridor width of 370' to 550'. No additional tree removal is anticipated with the exception of a 1.4-mile section located between Old Stage Road and Bradford Road in Wiscasset, where 75' of additional tree removal will be necessary on the eastern side of the existing cleared corridor.

The northern portion of Segment 5 is characterized by low rolling hills and numerous



linear ponds, small rivers, and meandering streams draining towards the Sheepscot River. Most landforms rise 60 to 400 feet above the surrounding landscape. Vegetative cover throughout the segment is mixed coniferous and deciduous second growth, with many open fields. The transmission line is predominantly edged with 40 to 60-foot tall mixed second growth hardwoods and softwoods.

The area within three miles of the southern section of Segment 5 is characterized by rolling topography with steep-sided wooded ravines cut by streams draining south to Montsweag Bay and the Back River. The former Maine Yankee site at the southern end of Segment 5 is flat, with little vegetation except along the access roads. The vegetation on the land surrounding Segment 5 north of the Maine Yankee site is mixed deciduous and coniferous. The transmission line is edged with 40 to 60-foot tall mixed deciduous and coniferous trees.

Land uses in the immediate vicinity of the northern portion of Segment 5 are predominantly woodland, farmland, gravel pits, rural residential, and some limited commercial along Route 17. Land uses in the immediate vicinity of the southern portion of the Segment 5 transmission line are predominantly woodland, farmland, and rural residential, with highway commercial along the Route One corridor and industrial development near the Maine Yankee Substation site. Windsor is 1.5 miles to the northwest of Coopers Mills Substation, the village of Whitefield is 0.25 mile to the east, the Head Tide Historic District in Alna is 0.5 mile to the east, and the Wiscasset town center is approximately 1.0 mile to the east of Segment 5.

**Scenic Resources.** The Scenic Resources that were evaluated include the Alonzo Garcelon and Earle R. Kelley Wildlife Management Areas, the West Branch of the Sheepscot River, Sheepscot River, Back River between Wiscasset and Westport Island, Montsweag Brook on the Wiscasset/Woolwich town line, and several waterbodies (Savade Pond, Long Pond,

Travel Pond, Clary Lake, Dresden Bog). Historic structures and districts including Wiscasset Historic District and Head Tide Historic District were evaluated. Additional locally sensitive resources evaluated included villages, private and public conservation lands, and municipal lands.

**State or National Wildlife Refuge, Sanctuary, or Preserve or a State Game Refuge**

The Alonzo H. Garcelon Wildlife Management Area (WMA) in Windsor and the Earle R. Kelley (Dresden Bog) WMA in Dresden and Alna are within the Study Area, but the Project will not be visible from either area due to intervening topography and vegetation.

**Public Resource, such as the Atlantic Ocean, a Great Pond, or Navigable River**

The Project will be visible from the West Branch of the Sheepscot River in Windsor and from the Montsweag Brook in Wiscasset within the existing cleared transmission line corridor. Approximately 0.4 mile of West Branch is located within the existing cleared corridor south of Maxcy's Mill Road. The transmission line crossing of Montsweag Brook is at the southern end of the Montsweag Dam Preserve, a 22-acre area owned by the Town of Wiscasset. The Montsweag Brook and Montsweag Dam Preserve are used mainly for research by the State and Chewonki staff and students for ongoing monitoring after the removal of the Lower Montsweag Dam. There should be a minimal visual impact to these water bodies since the cleared width of the transmission line corridor will not change and the riparian vegetation within the stream crossing will be preserved.

The Sheepscot River from Wiscasset to the headwaters is rated as an "A" river by the Maine Rivers Study for its geologic/hydrologic, critical/ecologic, scenic, anadromous fisheries, inland fisheries, whitewater boating, and historic resources. The Project will not be visible from the main branch of the Sheepscot River.

Table 6-1. Summary of Photosimulations (Submitted September 2017)

| #                | PHOTOSIMULATION                                            | DESCRIPTION OF VIEWPOINT                                                                    |
|------------------|------------------------------------------------------------|---------------------------------------------------------------------------------------------|
| <b>Segment 1</b> |                                                            |                                                                                             |
| 1                | Beattie Pond, Lowelltown Twp                               | From northern end of pond looking south                                                     |
| 2                | Wing Pond, Lowelltown Twp                                  | From northern end of pond looking south                                                     |
| 3                | Rock Pond, T5 R6 BKP WKR                                   | From southeast side of pond looking north,                                                  |
| 4                | No 5 Mountain, T5 R7 BKP WKR                               | Summit of mountain within Leuthold Preserve, The Nature Conservancy                         |
| 5                | Fish Pond, Hobbstown Twp                                   | From southern end of the pond looking northwest                                             |
| 6                | Attean View Rest Area, Jackman                             | Route 201, looking southwest                                                                |
| 7                | Parlin Pond, Parlin Pond Twp                               | Looking southwest from the north east end of pond                                           |
| 8                | Coburn Mtn, Upper Enchanted Twp.                           | From summit looking southeast                                                               |
| 9                | Route 201, Johnson Mountain Twp                            | From intersection of Judd Road at Route 201                                                 |
| 10               | Kennebec Gorge, Moxie Gore                                 | On Kennebec River looking southwest from picnic area                                        |
| 11               | Kennebec Gorge, Moxie Gore                                 | On Kennebec River looking north from picnic area                                            |
| 12               | Moxie Stream, Moxie Gore                                   | From the north side of the stream, looking west                                             |
| <b>Segment 2</b> |                                                            |                                                                                             |
| 13               | Moxie Pond north, East Moxie Twp                           | Looking southwest from northern end of Moxie Pond                                           |
| 14               | Moxie Pond north, East Moxie Twp                           | Continued pan from northern end of Moxie Pond                                               |
| 15               | Moxie Pond south, Bald Mtn Twp T2 R3                       | Looking west from southern end of Moxie Pond                                                |
| 16               | Mosquito Mountain, The Forks Plt                           | Looking northeast from eastern overlook, on Bayroot LLC land                                |
| 17               | Mosquito Mountain, The Forks Plt                           | Continued pan looking southeast from eastern overlook, on Bayroot LLC land                  |
| 18               | Troutdale Road, The Forks Plt.                             | Looking southeast from road within existing corridor, private road                          |
| A                | Appalachian Trail – Pleasant Pond Mountain, The Forks, Plt | 230' southeast of surveyed from summit                                                      |
| B                | Appalachian Trail - Troutdale Rd, Bald Mtn Twp             | On AT within existing CMP corridor looking southeast towards Joe's Hole                     |
| C                | Appalachian Trail - Bald Mountain, Bald Mountain Twp       | From summit                                                                                 |
| <b>Segment 3</b> |                                                            |                                                                                             |
| 19               | Route 201, Moscow                                          | View looking northeast from within existing transmission line crossing, east of Wyman Hydro |
| 20               | Wyman Lake Recreation Area, Pleasant Ridge Plt             | View looking northeast from beach toward dam, area managed by Brookfield                    |
| 21               | Route 8, Anson                                             | View looking north within existing transmission line crossing                               |
| 22               | Route 2, Farmington                                        | View looking south within existing transmission line crossing                               |
| 23               | Androscoggin Riverlands State Park, Leeds                  | View looking south within existing transmission line crossing                               |

| #                                                                       | PHOTOSIMULATION                                                             | DESCRIPTION OF VIEWPOINT                                                                                                                                                                                                                                                                                                                 |
|-------------------------------------------------------------------------|-----------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 24                                                                      | Merrill Road, Lewiston                                                      | Looking north from within existing transmission line crossing                                                                                                                                                                                                                                                                            |
| <b>Segment 4</b>                                                        |                                                                             |                                                                                                                                                                                                                                                                                                                                          |
| 25                                                                      | Riverside Drive, Auburn                                                     | Looking north across Androscoggin River                                                                                                                                                                                                                                                                                                  |
| 26                                                                      | Fickett Road Substation, Pownal                                             | Looking southwest from Fickett Road towards proposed substation                                                                                                                                                                                                                                                                          |
| <b>Segment 5</b>                                                        |                                                                             |                                                                                                                                                                                                                                                                                                                                          |
| 27                                                                      | Route 1, Wiscasset                                                          | Looking south in existing transmission line crossing                                                                                                                                                                                                                                                                                     |
| 28                                                                      | Route 27, Wiscasset                                                         | Looking north in existing transmission line crossing                                                                                                                                                                                                                                                                                     |
| 29                                                                      | Route 194, Whitefield                                                       | Looking south in existing transmission line crossing                                                                                                                                                                                                                                                                                     |
| <b>Table 6-1 Expanded. Summary of Photosimulations – POST SUBMITTAL</b> |                                                                             |                                                                                                                                                                                                                                                                                                                                          |
| <b>Segment 1</b>                                                        |                                                                             |                                                                                                                                                                                                                                                                                                                                          |
| 30                                                                      | Kennebec Gorge Crossing, Looking Northwest, 3 structure option              | Views from within the Proposed Corridor on the Kennebec River<br>Prepared in response to DEP request, Completed 4/10/18                                                                                                                                                                                                                  |
| 31                                                                      | Kennebec Gorge Crossing, Looking Southeast, 3 structure option              | Views from within the Proposed Corridor on the Kennebec River<br>Prepared in response to DEP request, Completed 4/10/18                                                                                                                                                                                                                  |
| 32                                                                      | Kennebec Gorge Picnic Area, Looking Southwest, 3 structure Option,          | Revised Psim 32 that was initially submitted in Sept 2017, revised in response to LUPC comments on Jan 22, 2018, and then again on April 10, 2018 regarding the appearance of the conductor location relative to taller white pines along the shoreline and the warped "fish eye" effect of view because of proximity. Completed 4/10/18 |
| 33                                                                      | Kennebec Gorge North of Picnic Area, Looking Southwest, 3 Structure Option. | View from the Kennebec River north of the Moxie Falls Rafting Company's picnic area. Represents the first point of Project visibility for rafters/kayakers. Completed 12/12/17                                                                                                                                                           |
| <b>Segment 2</b>                                                        |                                                                             |                                                                                                                                                                                                                                                                                                                                          |
| 34                                                                      | Carrabassett River, Anson                                                   | View looking north from within the Proposal Corridor crossing on the river. Prepared in response to DEP request 11.20.17. Completed June 2018                                                                                                                                                                                            |
| 35                                                                      | Sandy River, Farmington                                                     | View looking south from within the Proposal Corridor crossing on the river. Prepared in response to DEP request 11.20.17. Completed June 2018                                                                                                                                                                                            |
| <b>Segment 5</b>                                                        |                                                                             |                                                                                                                                                                                                                                                                                                                                          |
| 36                                                                      | West Branch Sheepscot River (Looking West), Windsor                         | View looking west from within the Proposal Corridor crossing on the river. Prepared in response to DEP request 11.20.17. Completed June 2018                                                                                                                                                                                             |
| 37                                                                      | West Branch Sheepscot River (Looking North), Windsor                        | View looking north from within the Proposal Corridor crossing on the river. Prepared in response to DEP request 11.20.17. Completed June 2018                                                                                                                                                                                            |



| Note: Photosimulation 38 - 41 were completed for the Brookfield Option near Harris Dam |                                                           |                                                                                                                                                                              |
|----------------------------------------------------------------------------------------|-----------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Leaf Off - Snow Cover Photosimulations – January 2, 2019</b>                        |                                                           |                                                                                                                                                                              |
| #                                                                                      | PHOTOSIMULATION                                           | DESCRIPTION OF VIEWPOINT                                                                                                                                                     |
| <b>Segment 1</b>                                                                       |                                                           |                                                                                                                                                                              |
| 42                                                                                     | Parlin Pond, Parlin Pond Twp                              | View looking southwest from the north east end of pond                                                                                                                       |
| 43                                                                                     | Route 201 in Parlin Pond Twp                              | View looking southwest from Route 201, from west of Parlin Pond, toward Coburn Mountain                                                                                      |
| 44                                                                                     | Coburn Mountain, Upper Enchanted Twp                      | View looking east to south from the observation tower at summit, includes a view of the proposed tapered vegetation management for portion of corridor visible in foreground |
| 45                                                                                     | ITS 89, Parlin Pond Twp                                   | View looking south from a point north of Spencer Road on Weyerhaeuser land                                                                                                   |
| 46                                                                                     | ITS 87, Cold Stream Forest Parcel<br>Johnson Mountain Twp | View looking southeast from the ITS 87 snowmobile bridge over Cold Stream, in Cold Stream Forest Parcel adjacent to Capital Road/ Weyerhaeuser land                          |
| 47                                                                                     | Cold Stream Mountain, Johnson<br>Mountain Twp,            | View looking south from a local snowmobile on Cold Stream Mountain on Weyerhaeuser land                                                                                      |
| <b>Segment 2</b>                                                                       |                                                           |                                                                                                                                                                              |
| 48                                                                                     | Mosquito Mountain, Northeast,<br>The Forks Plt            | View looking northeast from the summit of Mosquito Mountain on Bayroot LLC. land                                                                                             |
| 49                                                                                     | Mosquito Mountain, Southeast,<br>The Forks Plt            | View looking southeast from the summit of Mosquito Mountain on Bayroot LLC. land                                                                                             |
| 50                                                                                     | Troutdale Road,<br>Bald Mountain Twp                      | View from AT co-located with Troutdale Road within existing CMP corridor, looking southeast, private road                                                                    |
| 51                                                                                     | Bald Mountain, Southwest,<br>Bald Mountain Twp            | View looking southwest from the summit of Bald Mountain on the Appalachian Trail                                                                                             |
| 52                                                                                     | Bald Mountain, Northwest,<br>Bald Mountain Twp            | View looking northwest from the summit of Bald Mountain on the Appalachian Trail                                                                                             |
| 53                                                                                     | Route 201 in Moscow                                       | View looking northeast from Route 201 within the existing transmission line corridor                                                                                         |



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED DIRECT TESTIMONY AND EXHIBITS OF  
TERRENCE J. DEWAN

Regarding

- Issue 1: Scenic Character and Existing Uses
- Issue 3: Alternatives Analysis

February 28, 2019

**I. Qualifications of Witness (Relevant to DEP and LUPC Review)**

My name is Terrence DeWan. I am the principal and founder of Terrence J. DeWan & Associates, a landscape architecture and planning firm located at 121 West Main Street in Yarmouth, Maine. I received a Bachelors of Science in Landscape Architecture (BSLA) degree

in 1968 from the State University of New York College of Environmental Sciences and Forestry in Syracuse, New York.

I served as a consultant to the Maine Department of Environmental Protection (DEP) in the development of the Chapter 315 Scenic Impact Rules. I authored the Scenic Assessment Handbook for the Maine State Planning Office. I served as an advisor to the Governor's Task Force on Wind Power Development in Maine. I served on a state-sponsored study group to develop an assessment of cumulative visual impacts from wind power development. I recently served as an advisor to the Land Use Planning Commission on rules pertaining to Hillside Development in the Unorganized Territories. Over the past decade I have been invited to deliver presentations on visual assessment procedures and related topics at several national conferences (e.g., American Society of Landscape Architects, American Planning Association, and National Association of Environmental Professionals). I recently completed two peer reviews for the Argonne National Laboratory on visual impact analysis: one for the National Park Service, the other for the Bureau of Land Management. In 2011, I was elected to become a Fellow of the American Society of Landscape Architects, the first person from Maine ever to achieve that honor. I am currently the chair of the Maine State Board for Licensure of Architects, Landscape Architects, and Interior Designers. My resume is attached hereto as Ex. CMP-6-A.

## **II. Purpose and Scope of Testimony (Relevant to DEP and LUPC Review)**

This testimony provides my assessment of the potential effect that the Project may have on scenic and aesthetic uses. I conclude with my opinion that the Project will not unreasonably interfere with existing scenic and aesthetic uses, and does not diminish the public enjoyment and appreciation of the qualities of the scenic resources, and any potential impacts have been minimized. The activity will not have an unreasonable impact on the visual quality of protected



natural resources as viewed from a scenic resource. The development will not adversely affect scenic character. There are no practicable alternatives to the proposed activity that will have less visual impact, and there is no reasonable alternative to the outstanding river segment crossings that would have less adverse effect upon the natural and recreational features of these river segments. With respect to portions of the Project located in LUPC's P-RR subdistricts, the Project will be buffered from those uses within the vicinity or area likely to be affected by the proposal with which it is or may be incompatible, and there is no alternative site which is both suitable to the proposed use and reasonably available to CMP.

### **III. Summary of Testimony (Relevant to DEP and LUPC Review)**

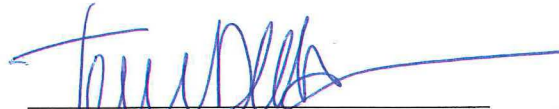
I hereby adopt the pre-filed direct testimony Amy Bell Segal as if it were my own.

#### Exhibits:

CMP-6-A: DeWan CV

Dated: 2.26.19

Respectfully submitted,

  
Terrence J. DeWan

STATE OF MAINE

York, ss.

The above-named Terrence J. DeWan did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

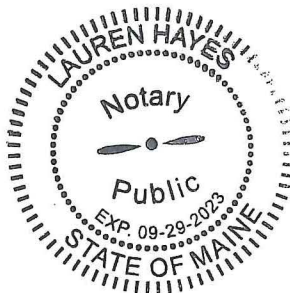
Before,

Dated: 2.26.19

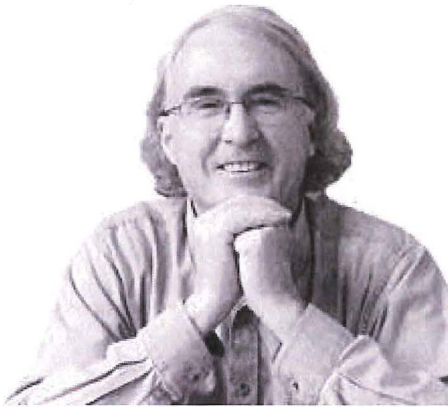
Notary Public

Name: LAUREN HAYES

My Commission Expires:







## TERRENCE J. DEWAN FASLA

### PRINCIPAL

Terry DeWan has over 45 years of professional experience in landscape architecture, visual resource assessment, site planning, design guidelines and community development. His experience includes work with communities, state agencies, private developers, utility companies, and the forest products industry in New England. He has written numerous studies on visual impacts, community planning, recreation planning, water access and highway corridor redevelopment.

### SELECTED PROJECT EXPERIENCE

#### Visual Impact Assessments

**NEW ENGLAND AQUA VENTUS, Off Monhegan Island, ME.** Visual Impact Assessment (VIA) for a 12 MW floating wind pilot project to produce renewable energy off Maine's shore. The project includes two 6 MW turbines on semi-submersible hulls designed by the University of Maine and partners.

**NORTHERN PASS TRANSMISSION PROJECT, Northern and Central NH.** VIA for a 192-mile transmission line to bring 1,090 MW of energy from Hydro-Quebec to NH and the rest of New England. Eversource.

**BULL HILL AND HANCOCK WIND PROJECTS, Hancock County, ME.** VIA for adjacent wind projects with a total of 37 turbines with a capacity of 89 MW. Blue Sky East LLC

**SPRUCE MOUNTAIN WIND PROJECT, Woodstock, ME.** VIA for a 10-turbine wind project with a capacity of 20 MW. Patriot Renewables.

**SADDLEBACK MOUNTAIN WIND PROJECT, Carthage, ME.** VIA for a 12-turbine wind project with a capacity of 34 MW. Patriot Renewables.

**MAINE POWER RELIABILITY PROGRAM.** VIA for 352 miles of new 115 kV and 345 kV transmission line corridor system upgrades in 82 Maine towns, for Central Maine Power.

**STETSON I & II WIND PROJECT, Washington County, ME.** VIAs for two adjacent projects with a total of 55 turbines with a capacity of 82 MW. Evergreen Wind V, LLC.

**PINNACLE WIND FARM AT NEWPAGE, Keyser, West Virginia.** Visual impact assessment in support of state permitting applications for a 23-turbine wind project with a capacity of 55 MW. US Wind Force / Edison Mission Energy.

**MAINE GOVERNOR'S TASK FORCE ON WIND POWER DEVELOPMENT.** Consultant on aesthetics and visual resources to the Governor's Task Force.

**MAINE DEP / VISUAL ASSESSMENT RULES.** Consultant to DEP in the formulation of Chapter 315 Regulations: Assessing and Mitigating Impacts to Existing Scenic and Aesthetic Uses. Served on DEP Task Force for the development of the rules.

**HUDSON LANDING, Kingston, NY.** A review of the VIA and Development Guidelines for a 1,750-unit community on the Hudson River. Redesign of the site to incorporate sustainable development principles in recognition of its proximity to Scenic Areas of Statewide Significance. Hudson River Heritage.

### PROFESSIONAL LICENSURE

Maine Licensed Landscape Architect #6

### EDUCATION

BSLA State University of New York  
Environmental Sciences and Forestry  
Cum Laude

### PROFESSIONAL EMPLOYMENT

1988 - present Terrence J DeWan & Associates  
Landscape Architects & Planners  
Yarmouth, ME

1977 - 1988 Mitchell-DeWan Associates  
Landscape Architects & Planners  
Portland, ME

1976 - 1977 Center for Natural Areas  
South Gardiner, Maine

1973 - 1976 Moriece and Gary of Maine  
Portland, ME

1971 - 1973 The Architects Workshop  
Philadelphia, PA

1970 - 1971 Peter G. Rolland and Associates  
Rye, NY

### PROFESSIONAL AFFILIATIONS

Maine State Board for Licensure of Architects,  
Landscape Architects and Interior Designers

American Society of Landscape Architects

Boston Society of Landscape Architects

American Planning Association

Maine Association of Planners

Council of Landscape Architects Registration  
Boards

Royal River Conservation Trust, Board of  
Directors



## AWARDS AND EXHIBITIONS

Fellow, American Society of Landscape Architects

Council of Landscape Architects Registration Boards. Presidents Awards.

Boston Society of Landscape Architects Excellence Award for Outstanding Professional Practitioner.

Boston Society of Landscape Architects Merit Award for Planning: From the River to the Bay: a Parks, Recreation and Open Space Plan for Brunswick, Maine.

American Society of Landscape Architects Merit Awards for Communications:  
Los Angeles River Greenway.  
Chattahoochee River Greenway, Atlanta GA

Maine Association of Planners  
Scenic Assessment Handbook  
Scenic Inventory of Penobscot Bay  
A Guide to Livable Design  
Portland Shoreway Access Plan

## SELECTED PUBLICATIONS

Design Guidelines, Salem, NH. Adopted by Planning Board March 2010.

Scenic Assessment Handbook, Maine State Planning Office. 2008.

Royal River Corridor Study. Town of Yarmouth, Maine. With Stantec. 2008.

A Vision for the Moosehead Lake Region. Natural Resources Council of Maine. 2006.

Kittery Design Handbook. Kittery Planning Board. 2004

The Great American Neighborhood, A Guide to Livable Design. ME SPO. 2004.

Scenic Inventory, Mainland Sites of Penobscot Bay. Maine State Planning Office. 1990.

Scenic Assessment, Lincolnville, Maine.

**ST. LAWRENCE CEMENT, Hudson, NY.** Led a team of visual and cultural specialists to evaluate potential scenic impacts from a proposed cement plant for groups concerned about the future of nearby historic Hudson Valley communities. Project was ultimately rejected by the NY Department of State. Scenic Hudson and Friends of Olana.

**DOWNEAST LNG, Robbinston, ME.** VIA for LNG terminal on the shores of Passamaquoddy Bay. Project would have included an LNG storage tank, an import/export pier, and various shorefront facilities. Downeast LNG, Inc.

**BANGOR HYDRO-ELECTRIC. SECOND 345 KV TIE LINE.** VIA for a new 345 kV transmission line along the Stud Mill Road from Orrington, ME to New Brunswick, Canada.

## Scenic Inventories + Conservation Plans

**FISH RIVER LAKES CONCEPT PLAN, Northern Arrostook County, ME.**  
A long-range conservation and limited development plan for 50,000 Ac of woodlands in Northern Maine. Irving Woodlands.

**SCENIC INVENTORIES: MAINLAND SITES OF PENOBSCOT BAY, ISLESBORO, VINALHAVEN, NORTH HAVEN, Maine State Planning Office**

**ROUTE 27 SCENIC INVENTORY AND SCENIC BYWAY CORRIDOR MANAGEMENT PLAN.** Long-term plan for Route 27 between Kingfield and Canada. Maine Department of Transportation.

**PRELIMINARY FACILITIES AND INTERPRETIVE MEDIA PLAN, KANCAMAGUS SCENIC BYWAY, White Mountain National Forest, New Hampshire.** Demonstration forest, hiking trails, interpretive exhibits, overlooks, outdoor amphitheater.

## Peer Reviews

**ARGONNE NATIONAL LABORATORY**  
Best Management Practices for Reducing Visual Impacts of Renewable Energy Facilities on BLM-Administered Lands  
National Park Service Visual Impact Assessment Guidance Document.

**CAPE WIND ENERGY PROJECT, Nantucket Sound, MA.** Peer review of DEIS prepared by Minerals Management Service.

## Selected Presentations

**THE MAINE WIND ENERGY ACT IN A TIME OF CHANGE.** Visual Resource Stewardship Conference, Argonne National Laboratory, Lemont IL November 2017

**THE MAINE WIND ENERGY ACT, VISUAL ASSESSMENT PROCEDURES FOR GRID SCALE WIND PROJECTS,** National Association of Environmental Professional Meeting, Portland, OR 2012

**SOCIAL ACCEPTANCE OF WIND ENERGY- ADDRESSING VISUAL IMPACT IN SKEPTICAL COMMUNITIES.** ASLA Annual Meeting San Diego, CA. 2011.

**SCENIC INVENTORY TRAINING.** Washington and Hancock Counties, Maine State Planning Office. 2009.



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED DIRECT TESTIMONY AND EXHIBITS OF  
PEGGY DWYER

Regarding

- Issue 1: Scenic Character and Existing Uses

February 28, 2019

**I. Qualifications of Witness (Relevant to DEP and LUPC Review)**

From 2009 until the present, I have worked for Dirigo Partners Ltd. (Dirigo) as Lead Agent on Special Projects. Dirigo provides contract real estate services to Central Maine Power Company (CMP) and its affiliate companies. In my role as a Lead Agent on Special Projects, I conduct preliminary and alternate route development, analysis, and mapping in the field and using GIS technology. I collaborate with surveyors, title attorneys, construction contractors, and

CMP's permitting, regulatory, and environmental services to refine routing. I work as a liaison between landowners and CMP, serving as landowners' primary point of contact with CMP, from the negotiation and acquisition stages of project development through the permitting, construction, post-construction, and mitigation stages of project development.

Outside of my work with Dirigo, I am an avid outdoorswoman. I have been an active member of the Forks area river-running community since 1988. For 10 years, I leased a camp in The Forks. My life partner was a forester with Scott Paper Company, Sappi, and Plum Creek, now Weyerhaeuser. His area of responsibility included the Project area from West Forks to the Canadian border, and together we spent countless hours exploring, hunting, fishing, and enjoying the region's roads, woods, and waters. I am a whitewater guide, kayaker, and wilderness trip leader. I worked for Voyagers Whitewater and Professional River Runners, leading day trips and overnight excursions, and training professional river guides, from 1988 to 2008. I have participated in and led numerous private, commercial, and scientific expeditions on the Colorado River through Grand Canyon National Park, from 1991 through last year. I am planning to work another Grand Canyon expedition this fall, and I continue to lead private trips on Maine's navigable rivers as a private boater, focusing most of my time on the Kennebec River in the reach from Harris station to Caratunk.

Attached hereto as Exhibit CMP-7-A is my CV, which provides additional background on my experience relevant to this testimony.

## **II. Purpose and Scope of Testimony (Relevant to DEP and LUPC Review)**

My testimony concerns whether the New England Clean Energy Connect Project (NECEC or Project) will adversely affect or unreasonably interfere with existing recreational and navigational uses. My testimony further concerns whether the Project can be buffered from



recreational and navigational uses within the Land Use Planning Commission's (LUPC) Recreation Protection (P-RR) subdistrict.

### **III. Summary of Testimony (Relevant to DEP and LUPC Review)**

Based on my experience as an avid outdoorswoman who has personally utilized the Project area for recreational and navigational uses for decades, the Project will not adversely affect, nor will it unreasonably interfere with, existing recreational or navigational uses. So too will the Project be buffered from recreational and navigational uses within the LUPC's P-RR subdistrict.

### **IV. Recreational and Navigational Uses (Relevant to DEP and LUPC Review)**

For more than 30 years, I have used vast tracts of private working forest land, including the extensive network of logging roads and bridges paid for and maintained by the large landowners who allow recreational use on their property, provided that it does not interfere with their primary uses of forest and dam management. It is beautiful there, but I would by no means call it wilderness. I am well accustomed to the sights, sounds, and smells of active forest management on an industrial scale. These impacts have in no way dampened my enthusiasm for hunting, fishing, and foraging; hiking, biking, and snowmobiling; and birding and boating in the areas the Project will cross and from which the Project will be visible between Caratunk and Canada, including those areas in the LUPC's P-RR subdistrict.

The NECEC Project will not adversely impact my enjoyment of this area. A strip of land will be converted from part of an industrial woodlot currently cycling through stages of growth and harvesting to a stable green zone of shrub-scrub habitat.

#### Beattie Pond

The NECEC corridor creates no new access to Beattie Pond. CMP will have access through the gate for construction and maintenance of the transmission line, but has agreed to

honor the landowner's access policy. Current landowner policy does not allow public vehicle access beyond a point 0.6 mile from the pond, and access is only between June 1 and September 30.

#### Kennebec River Gorge

CMP's underground crossing of the Kennebec River above Moxie Stream will be undetectable to the Kennebec river-running community. Plans show clearing for the termination stations at about 1,150 feet from the edge of the river on the west side and about 1,450 feet from the edge of the river on the east side. Termination structures are located an additional 400+/- feet further from the edge of the river. Because the NECEC will be underground at the Kennebec River crossing, it will have no recreational, navigational, or visual impact to the river.

#### Moxie and Cold Stream

Although the NECEC will be visible from some river-running put-in locations, it will not have a negative impact. A very small subset of boaters, mostly expert whitewater kayakers, occasionally run Moxie Stream and Cold Stream during high water events, typically during early spring and late fall. Navigational conditions include high water volume, steep gradient, and very cold temperatures. Please refer to the attached exhibit, labeled CMP-7-B, which shows typical boating conditions for Cold Stream. Exhibit CMP-7-C shows typical boating conditions for Moxie Stream. Both of these exhibits also show that the Moxie Stream and Cold Stream NECEC Project crossings occur at the traditional put-in (the beginning of a river run) areas used by private boaters accessing the river over private roads.

When I ran those streams, I was there purely for the adrenaline. The presence of an overhead crossing at the put-in would make no difference to me. In fact, most of the other premiere whitewater runs in Maine, including the Kennebec Gorge, Ripogenus Gorge, the

Carrabassett River, and most of the smaller and more challenging runs, begin at or under transmission lines, adjacent to dams or bridges, and along roadsides.

### Moxie Pond

The NECEC transmission line will be located in the existing CMP transmission line corridor, which crosses the south end of Moxie Pond where Baker Stream enters Moxie Pond at what is known as Joe's Hole. Additional clearing of 75 feet will occur, but the cleared area will remain early successional shrub-scrub. Recreational use will not be impacted. Small water craft will be able to pass under the NECEC transmission line just as small water craft currently pass under the existing CMP transmission line. The only two recreational uses that could possibly be affected by either the existing transmission line or the NECEC line are floatplane takeoff/landing and use of a sailboat under the line. Joe's Hole is of marginal size for either of these uses; there are no known issues with either of these uses and the existing line, which is closer to the water and more exposed to the open pond than the NECEC line will be.

CMP has made extensive provision for buffering the development from recreational and navigational uses. The most efficient alignment of a new transmission line starts with a straight line from point A to point B. Every angle point you see on the Project overview (see Exhibit CMP-7-D) represents a thoughtful, proactive effort to minimize an impact at the planning stage, to move away from a water body, road, or viewshed, tuck the line behind screening topography, and to situate as much of the line as possible on intensely managed industrial forest land. These efforts have resulted in minimizing any impact on recreational and navigational uses.

### **V. Conclusion (Relevant to DEP and LUPC Review)**

It is my opinion that the Project will not adversely affect, nor will it unreasonably interfere with, existing recreational or navigational uses. Where the Project is located within the P-RR subdistrict, it will be buffered from other uses and resources within that subdistrict.

Exhibits:

CMP-7-A: Dwyer CV

CMP-7-B: Navigational Conditions on Cold Stream

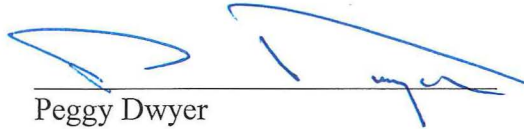
CMP-7-C: Navigational Conditions Moxie Stream

CMP-7-D: Thoughtful siting on private land purchased from supporting landowners



Dated: February 26, 2019

Respectfully submitted,

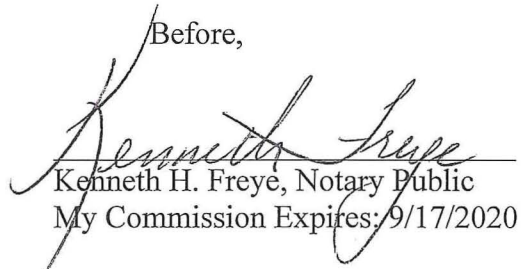
  
Peggy Dwyer

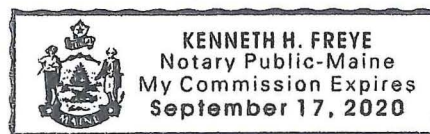
STATE OF MAINE  
Kennebec, ss.

The above-named Peggy Dwyer did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Dated: February 26, 2019

Before,

  
Kenneth H. Freye, Notary Public  
My Commission Expires: 9/17/2020





**Peggy Dwyer**  
 Dirigo Partners Ltd.  
 83 Edison Drive, Augusta, Maine 04336  
 (207) 897-5730  
 peggy.dwyer@dirigopartnersltd.com

### **Education**

State University of New York, Delhi, NY  
 Associate of Applied Science (AAS), 1977  
 Concentration: Veterinary Medical Technology

### **Relevant Professional Experience**

#### **Lead Agent/Special Projects**

- Dirigo Partners Ltd.

April 2009 - Present  
 Augusta, Maine

Project development, mapping, and field work for client Central Maine Power Company and affiliates, including collaboration with surveyors, title attorneys, construction contractors, permitting, regulatory, and environmental services. Provide site and project-specific reports, exhibits, and updates. Acquire real estate required to support special projects. Serve as the landowner's primary point of contact with the client from acquisition and permitting through post-construction remediation.

#### **Resource Administrator/Lease Manager**

- Dirigo Partners Ltd.

April 2013 - Present  
 Augusta, Maine

Professional management of 1,300 acres of real estate in Maine and New Hampshire's Upper Androscoggin River region, including 80 individual leases for seasonal camps and boat docks, commercial recreation, hydropower generation, and an Atlantic salmon hatchery.

#### **Resource Administrator, Maine Department of Conservation**

- Maine Land Use Regulation Commission

January 2000 - June 2008  
 Augusta, Maine

Provided analysis, management, and reporting of fiscal, planning, and legislative issues relevant to land use planning and development within Maine's Unorganized Territory. Worked to develop and retain a fully engaged board of Commissioners able to meet their land use planning and oversight responsibilities. Conducted and led public meetings, site inspections, and field trips with LURC Commissioners, legislators, and large landowners throughout the jurisdiction.

### **Relevant Recreational and Navigational Experience**

#### **Whitewater Guide and Wilderness Trip Leader**

- Private boater and trip leader (1988 - Present)
- National Park Service (2009 - 2018)
- Professional River Runners of Maine (1992 - 2013)

1988 - Present  
 Maine Rivers  
 Grand Canyon, Arizona  
 West Forks, Maine

- Canyoneers Inc. (2007) Grand Canyon, Arizona
- Voyagers Whitewater (1988 - 1991) West Forks, Maine

More than 30 years of experience providing and supporting safe and challenging outdoor experiences, as well as teaching technical outdoor skills and environmental ethics to people of all ages and abilities on commercial, private, research, and cultural trips.

### **Professional Certifications and Registrations**

- Qualified Boat Operator (Canyoneers Inc., Ceiba Adventures, National Park Service)
- Maine State Licensed Real Estate Broker (with specialized experience in transmission line corridor and substation acquisition, landowner negotiations, title work, document production, survey, mapping, and GIS)

### **Civic and Charitable Activities**

Tail Waggin' Tutors, Spruce Mountain Elementary School September 2008 - Present  
 • Therapy Dogs International, Inc. Livermore, Maine

Providing qualified volunteer handlers and their certified therapy dogs for visitations in a variety of facilities.

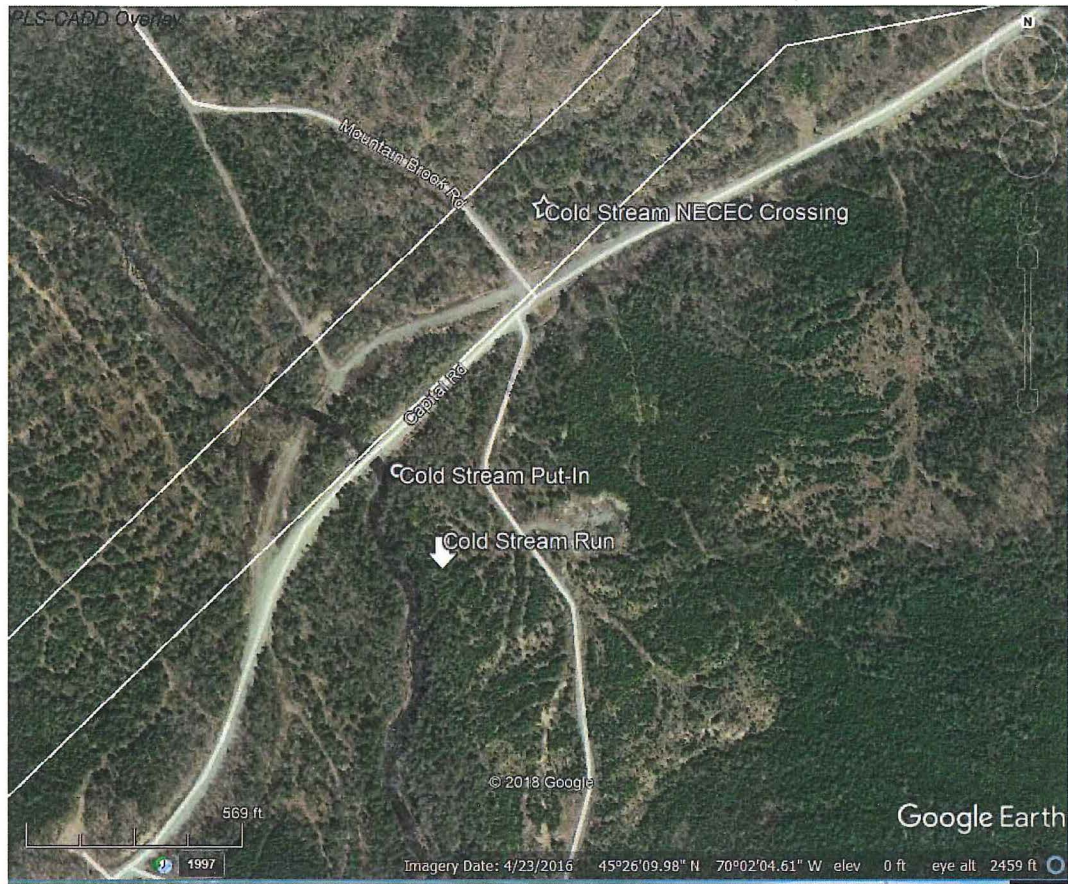
Town of Livermore Board of Appeals January 2009 - Present  
 • Town of Livermore Livermore, Maine

Comprehensive Plan Committee October 2006 - April 2008  
 • Town of Livermore Livermore, Maine





## Cold Stream Put-In



## Cold Stream Boater







## Moxie Stream Put-In

## Navigational Conditions on Moxie Stream



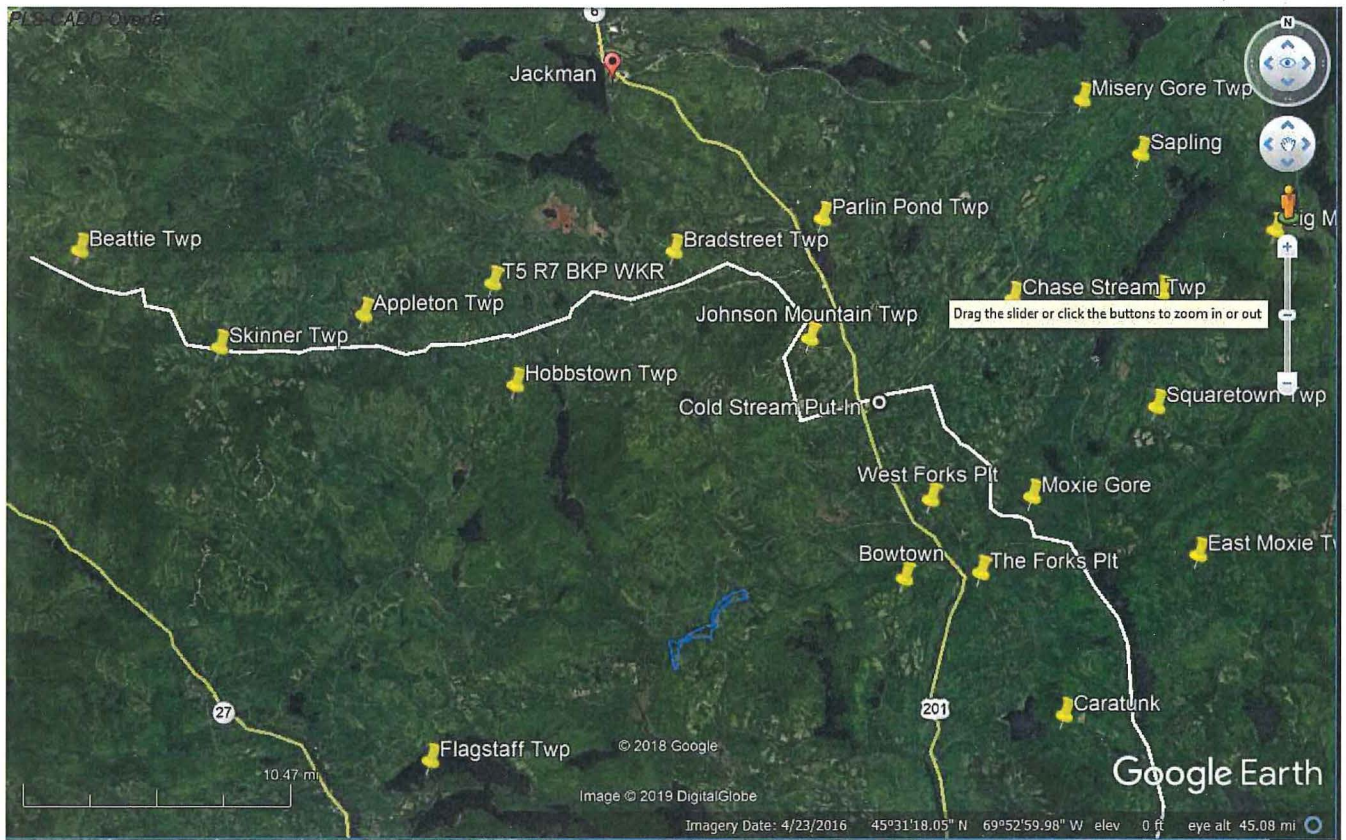
## Moxie Stream Boater







Thoughtful siting on private land purchased from supporting landowners  
Proactive planning fit the development harmoniously into the existing natural environment and buffers it from public recreational and navigational uses.





STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED DIRECT TESTIMONY AND EXHIBITS OF  
BRIAN BERUBE

Regarding

- Issue 3: Alternatives Analysis

February 28, 2019

**I. Qualifications of Witness (Relevant to DEP and LUPC Review)**

My name is Brian Berube and I am the Manager of Real Estate Services for AVANGRID Service Company on behalf of Central Maine Power Company (“CMP”) for the New England Clean Energy Connect Project (“NECEC” or “Project”).



I have been a real estate, land surveying, and GIS (Geographic Information System) professional for over 10 years, working with a variety of clients as a consultant and real estate professional and now for AVANGRID Service Company on behalf of CMP for the NECEC Project. I obtained my Bachelor of Science, Forest Operations from the University of Maine in December 2008. In May 2011, I obtained a Master of Business Administration, Finance from the University of Maine. I hold active professional licenses and certificates including a Maine Associate Brokers License (BA9191329), a Maine State Land Surveyors License (PLS 2500), and a GIS Professional certificate (91819).

From January 2008 to September 2012 I was employed by CES, Inc. in Brewer, Maine as a GIS Analyst/Land Surveyor Technician, and then with Nadeau Land Surveys in Portland, Maine from September 2012 to September 2013 as a GIS Project Manager/Professional Land Surveyor. During this time period I provided consulting services for integrated GIS solutions for a variety of clients and performed services including siting new transmission and substation assets for energy clients within the State of Maine.

From September 2013 to April 2015, I was employed by The Boulos Company (formerly CBRE | The Boulos Company) in Portland, Maine. In that role I was responsible for contract negotiations, financial and underwriting analysis, site location development analysis, and executing brokerage assignments related to the purchase, sale, and leasing of commercial real estate assets.

From March 2015 to May 2018, I was a lead and senior lead GIS Analyst with AVANGRID Service Company responsible for integrating and implementing GIS solutions for a variety of business areas including outage management and response, data analytics, field operations, customer service and emergency preparedness.

In my current role, I am responsible for the procurement, disposition, and management of Networks real property assets for all AVANGRID operating companies including on behalf of CMP for the NECEC Project.

My CV is attached hereto as Exhibit CMP-8-A.

## **II. Purpose and Scope of Testimony (Relevant to DEP and LUPC Review)**

This testimony discusses CMP's consideration and analysis of alternatives to the proposed location and character of the NECEC Project, and demonstrates that there are no alternatives that would lessen its impact on the environment or the risks it would engender to the public health or safety, without unreasonably increasing its cost. As described below, and as set forth in its September 27, 2017 and October 19, 2018 applications, CMP has demonstrated that a less environmentally damaging practicable alternative to the Project, which meets the Project's purpose, does not exist. Where the Project crosses an outstanding river segment as identified in title 38, section 480-P, this testimony demonstrates that no reasonable alternative exists which would have less adverse effect upon the natural and recreational features of those river segments. This testimony is germane to both the DEP's and the LUPC's review of the Project.

## **III. Summary of Testimony (Relevant to DEP and LUPC Review)**

CMP has sufficiently analyzed alternatives to the Project and demonstrated that there are no alternatives that would lessen the Project's impact on the environment or the risks it would engender to the public health or safety, without unreasonably increasing its cost. A less environmentally damaging practicable alternative to the Project, which meets the Project's purpose, does not exist.

Where the Project crosses an outstanding river segment, CMP has demonstrated that no reasonable alternative exists which would have less adverse effect upon the natural and recreational features of that river segment. Furthermore, CMP has shown by substantial

evidence that there is no alternative site which is both suitable to the proposed use and reasonably available to CMP.

#### **IV. Issue 3 (Alternatives Analysis) Discussion (Relevant to DEP and LUPC Review)**

The alternative route analysis that CMP performed for the NECEC Project considered the entirety of the new HVDC line, which will run from the Canadian border to an interconnection point at Larrabee Road Substation (Segments 1, 2, and 3), and associated substation upgrades. An alternative route analysis was not performed for the remaining Project components (i.e., Section 62/64 115kV rebuilds (Segment 4) and the new Section 3027 345kV line (Segment 5)) because they are proposed in existing CMP corridors. As such, any route alternatives to these proposed line sections would occur in new corridors, which would not meet the objective of considering alternatives that would lessen project impact on the environment.

The three HVDC transmission line routes that CMP analyzed would meet the Project's purpose of delivering clean energy generation from Québec to New England. However, as discussed below, the two alternative routes, as compared to the Preferred Alternative, would result in more environmental impact than the proposed route for the NECEC corridor, and are not practicable.

CMP also considered the no-action alternative, which is not constructing the NECEC Project. However, that alternative would not meet the Project's purpose and need of allowing CMP to deliver 1,200 MW of the clean energy generation from Quebec to New England at the lowest cost to ratepayers. Nor is there any evidence that another project could be built to satisfy the Project's purpose and need, or that another project would be less environmentally damaging. Indeed, a non-CMP project would have unknown environmental impacts.

In addition to the comprehensive analysis of alternatives completed for the NECEC, the various segments of the route have been designed to include site-specific adjustments to utility

structure locations, temporary access roads, and substation designs that avoid and minimize potential natural resource impacts to the greatest extent practicable.

Each segment of the NECEC Preferred Alternative was assessed using GIS datasets available from the Maine Office of GIS, Maine Department of Inland Fisheries & Wildlife (MDIFW), Maine Natural Areas Program (MNAP), and the National Wetland Inventory (NWI). These datasets included: rare, threatened, and endangered species; unique natural areas; significant wildlife habitat; wetlands designated in the NWI; public lands (e.g., state and local parks); and conservation land trust properties. Field surveys were completed during the 2015, 2016, and 2017 field seasons to identify new and verify previously mapped vernal pools, wetlands, rivers, and streams. Desktop reviews of prehistoric and historic archaeological sites and historic architectural resources were conducted to locate potentially significant cultural resources. Visual analysis field surveys were conducted and photosimulations were created to study visual impacts.

After selecting the NECEC Preferred Alternative, CMP designed each transmission component to further avoid and minimize environmental impacts while maintaining a cost-effective and technically sound design in accordance with Chapters 310, 315 and 335.

These goals were achieved through two key design considerations: First, CMP attempted to site and design each NECEC transmission line segment within existing transmission corridors owned by CMP, although this was not practicable in all cases. Second, CMP will access the new corridor portions from secondary logging roads where practical, locate angle points near existing logging roads where practical, and manage tangent lengths to minimize the number of structures. CMP also established structure locations and temporary access roads that; to the extent practicable, avoided protected natural resources.



In some instances, construction within areas of mapped protected or sensitive species occurrences or plant communities cannot be avoided due to topography or safety concerns associated with existing infrastructure, but the proposed work will not necessarily adversely impact the species or identified resource. In some instances, rare plant or natural communities are enhanced by, or result from, conditions created and maintained within transmission line corridors. Furthermore, the species, plant community, or habitat mapped in the vicinity may not occur within the specific area of proposed construction, or may be absent at the time of construction. CMP has consulted with MNAP and MDIFW regarding potential rare, threatened, and endangered plant communities and animal occurrences along the proposed transmission line corridors to ensure that potential effects on sensitive biological resources during and after construction are avoided and minimized to the maximum extent practicable.

#### **A. Alternative Route Evaluation (Relevant to DEP and LUPC Review)**

The HVDC transmission alternatives were evaluated and compared based on the following parameters, as more fully discussed in Section 2.3.2.1 of the NRPA Application:

- Conserved Lands
- Existing Corridor
- Clearing
- Stream Crossings
- Transmission Line Length
- National Wetlands Inventory (NWI) Mapped Wetlands
- Deer Wintering Areas
- Inland Waterfowl and Wading Bird Habitat
- Public Water Supplies
- Significant Sand and Gravel Aquifers
- Parcel Count Total

#### **HVDC Alternative 1**

As more fully described in Section 2.3.2.2.1 of CMP's NRPA Application, in the late 1980s CMP attempted to acquire and permit a transmission line project from Québec to the

Lewiston, Maine area. It is in this corridor that CMP based HVDC Alternative 1 (Alternative 1). See Exhibit CMP-8-B. CMP acquired title, right, or interest on this corridor in the late 1980s, primarily through real estate option agreements. However, the Maine Public Utilities Commission did not approve this project and these real estate option agreements have since expired. The Alternative 1 corridor would extend from the Canadian border in western Maine approximately 119.3 miles to an interconnection point in Lewiston, Maine (*see Figure 1-1980's Quebec Corridor Description*). Alternative 1 would be located primarily in a new corridor and partially in undeveloped width in existing corridors. From the point of intersection with the Section 278 corridor (about 2.25 miles north of the Livermore Falls Substation) south to Larrabee Road Substation, a distance of approximately 26 miles, Alternative 1 is the same as the NECEC Preferred Alternative.

Table 1, attached hereto as Exhibit CMP-8-C, compares the NECEC Preferred Alternative with Alternative 1. As demonstrated in the table, and further explained in Section 2.3.2.2.2 of the NRPA Application, 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. For these reasons,

Alternative 1 is more environmentally damaging than the NECEC Preferred Route, would have a greater visual impact, and is not a practicable alternative.

## **HVDC Alternative 2**

As described in Section 2.3.2.3 of the NRPA Application, HVDC 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 Exhibit CMP-8-D. The line would be located partially in a new corridor and partially in undeveloped width in existing corridors. From the point of intersection with the Section 63 corridor in northeastern Concord Township, which is approximately 0.75 mile south of the Wyman Dam, Alternative 2 would follow the preferred route to Larrabee Road Substation in Lewiston.

Table 2, attached hereto as Exhibit CMP-8-E, compares the NECEC Preferred Alternative with Alternative 2. As demonstrated in the table, and further explained in Section 2.3.2.3.2 of the NRPA Application, Alternative 2, while slightly shorter and containing less new corridor than the Preferred Alternative, has more wetland and stream crossings than the Preferred Alternative and 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 Penobscot Indian Nation lands, the Bigelow Preserve, and the Appalachian Trail corridor. Past attempts by others, including Highland Wind and Fletcher Mountain Wind (a/k/a West Hills Wind) to develop transmission and generation in this area have not been successful; 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 would likely be opposed by the National Park Service. For these reasons, Alternative 2 is more environmentally damaging than the Preferred Alternative, would have greater visual impact, and is not a practical alternative.

#### **B. Alternative Locations to the Converter Station (Relevant to DEP Review)**

Section 2.3.3 of the NRPA Application describes six sites for the DC to AC converter station that CMP identified and evaluated based on adequacy of land area suitable for the converter station siting, location along the preferred HVDC transmission route, proximity to the nearest substation capable of interconnection, and potential impacts to the environment and on surrounding land uses. See Exhibit CMP-8-F.

The unimproved forested parcel owned by CMP on the south side of Merrill Road (CMP Parcel), the Larrabee Road Substation, and an Alternative Parcel 2 were ruled out as not being large enough to accommodate the proposed facility. The Alternative Parcel 3 on the south side of Merrill Road, northeasterly 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 and indicate the presence of wetlands. Therefore, Alternative Parcel 3 would have a greater environmental impact than the Preferred Parcel.

CMP identified the remaining two of the six properties as being most suitable: 1) the Preferred Parcel located along the Project corridor 0.5 mile north of Merrill Road in Lewiston; and 2) the Alternative Parcel 1 situated along an adjacent transmission corridor (0.6 mile from the Project corridor) located at the end of Taylor Hill Road in Lewiston.



However, Alternative Parcel 1 would require the HVDC line to extend an additional 0.5 mile, including one HVDC line crossing of U.S. Route 202 and one crossing of U.S. Route 202 by the 345kV tie line to the Larrabee Road Substation.

Alternative Parcel 1 would also require an approximately one mile segment of transmission line Section 61 and Section 255 to be placed on double-circuit structures, which is problematic for reliability reasons. Furthermore, the location of wetlands on the Alternative Parcel 1 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 access road to the site. The preferred site is positioned directly along the Project's HVDC corridor. There is one mapped significant vernal pool (SVP) on the preferred site; however, the six-acre converter station will be sited in an upland area outside of the SVP depression. Impacts will occur to the critical terrestrial habitat adjacent to this pool, but a significant amount of adjacent forestland will remain undeveloped in the immediate vicinity.

For these reasons, siting the converter station on Alternative Parcel 1 is more environmentally damaging than siting the converter station on the Preferred Parcel. Because it would have a greater environmental impact it is not a practical alternative to the Preferred Parcel.

### **C. Alternative Locations to the Coopers Mill Substation and the Fickett Road Substation (Relevant to DEP Review)**

When changes are proposed to CMP's electrical system, the electrical engineers in the CMP Transmission Planning department analyze the system to ensure the proposed changes do not adversely affect system reliability and stability. If the proposed upgrades do affect system reliability or stability, the Transmission Planning department identifies the necessary upgrades to ensure system reliability and stability. In this case, Transmission Planning identified the need for two static synchronous compensators (STATCOM) with ideal locations of Coopers Mill

Substation and Surowiec Substation. The STATCOM at Coopers Mill Substation is located on the existing substation yard within the existing fence.

The existing Surowiec Substation yard is not large enough to accommodate the new STATCOM there, and the site restrictions due to the location of Runaround Brook do not allow for an expansion of the yard. The parcel located north of the Surowiec Substation, bordered by Fickett Road and Allen Road, is on existing CMP-owned land adjacent to an existing CMP transmission line corridor. The close proximity of the proposed substation to Surowiec Substation will minimize the length of overhead transmission line required to connect the two substation sites, thereby minimizing the impacts as a result of siting new corridor for connecting the two substation sites as compared to any alternative location farther from Surowiec Substation.

**D. Alternatives to Outstanding River Segment Crossings (Relevant to DEP and LUPC Review)**

Maine law protects certain rivers that, “because of their unparalleled natural and recreational values, provide irreplaceable social and economic benefits to the people in their existing state.” 12 M.R.S. § 403. The NECEC Project crosses the following five locations which are afforded special protection as outstanding river segments, as identified in 38 M.R.S. § 480-P and 12 M.R.S § 403:

- Upper Kennebec River
- Kennebec River (below Wyman Dam)
- Carrabassett River
- Sandy River
- West Branch of the Sheepscot River

The Natural Resources Protection Act further governs proposed activities that cross any outstanding river segment as identified in Section 480-P and provides that “the applicant shall demonstrate that no reasonable alternative exists which would have less adverse effect upon the

natural and recreational features of the river segment.” 38 M.R.S. § 480-D(8). CMP provided an alternative analysis demonstrating that no reasonable alternative exists which would have less adverse effect upon the natural and recreational features of the river segment for each river segment the transmission line crosses. There are no reasonable available alternatives as the upper Kennebec River crossing is now underground. All other crossings are in existing transmission line corridor, so any alternatives would be required to be in new corridor and would significantly and unreasonably increase clearing and visual impact for these crossings.

Furthermore, CMP has taken measures to minimize the Project’s impacts to these outstanding river segments by crossing in locations where a CMP right-of-way already exists and/or through design modifications and/or increased riparian buffers. In the locations where the HVDC line is to be co-located within existing rights-of-way, CMP minimized additional clearing to an average additional width of 75 feet, and minimized additional natural resources impacts by proposing crossing locations in existing, developed transmission line corridors. CMP proposed to cross under the upper Kennebec River using horizontal directional drilling (HDD) in order to preserve the aesthetic value of this river segment and to prevent visual impacts to recreational and other river users. Additionally, in response to MDIFW’s comments, CMP committed to expanding riparian buffer from 25’ to 100’ for all outstanding river segments crossed by the Project, all perennial streams within the 54 mile new corridor segment, all cold water fishery streams, and all rivers/streams/brooks containing threatened or endangered species.

CMP also is including land preservation of three tracts along the Dead River to offset impact to existing recreational uses of outstanding river segments, which collectively will add 1,054 acres to Maine’s conserved lands and provide protection in perpetuity of 7.9 miles of river frontage along the Dead River, an outstanding river segment. See Exhibit CMP-8-G.

### **E. Alternative Analysis in the P-RR Subdistrict (Relevant to LUPC Review)**

CMP evaluated alternatives where impacts to LUPC subdistricts requiring special exception approval could not be avoided. A description of these subdistricts and a discussion of the alternatives evaluated is provided in the LUPC Certification section (Section 25) of the Site Law Application and of the Site Location of Development Application Amendment for the Kennebec River Horizontal Directional Drill, as well as in the LUPC Site Specific Alternatives Analysis (Section 2.4.1) of the NRPA Application and the Alternatives Analysis (Section 2) of the NRPA Application Amendment for the Kennebec River Horizontal Directional Drill. Those crossings within the P-RR subdistrict are further discussed below.

#### **Beattie Pond**

The Project corridor crosses the P-RR subdistrict associated with Beattie Pond, which is classified as a Management Class VI Lake. See Exhibit CMP-8-H.

The Project corridor is located within ¼-mile of the high-water mark of Beattie Pond but is located farther away from the pond than the existing road access. The P-RR zoning is intended to protect the pond from permanent improvements in access that could lead to more intensive use or development. The presence of a transmission line corridor at a distance greater than the existing developed road access will not include permanent improvements or use of existing improvements owned by others that promote more intensive use or development of the pond, and is therefore consistent with the intent of the P-RR zoning.

CMP attempted to negotiate an alternative alignment south of the Beattie Pond P-RR subdistrict through Merrill Strip Twp. Because the landowner demanded approximately 50 times fair market value for this property, CMP was unable to come to mutually-acceptable terms with the landowner. Re-routing north of the pond to avoid the P-RR subdistrict would result in



approximately two miles of additional corridor and associated vegetation clearing, and would lead to potentially higher visibility from the pond, due to the higher elevations associated with Caswell Mountain. Based on the analysis no alternative route exists that is suitable for the proposed use, and reasonably available to CMP.

As noted in CMP's January 25, 2019 letter to the DEP and LUPC, CMP evaluated the engineering design associated with transmission line structures adjacent to Beattie Pond in Lowelltown Twp., and determined that lowering the structure closest to Beattie Pond by 39 feet is feasible. This redesign will reduce the overall visual impact from the pond; as a result of this redesign, the Project will be minimally visible by recreational users on the pond.

#### **Upper Kennebec River Crossing**

The Project corridor crosses the P-RR subdistrict associated with the Upper Kennebec River in West Forks Plt and Moxie Gore. The P-RR subdistrict extends 250 feet from the normal high-water mark on both sides of the river. The transmission line within the horizontal directional drill (HDD) crossing is entirely underground as it passes below (and therefore not within) the P-RR subdistrict. The termination stations on either side of the river are located outside the P-RR subdistrict. Plans of the HDD crossing are attached hereto as Exhibit CMP-8-I.

The HDD installation and the development of the termination stations will not be visible from the P-RR subdistrict and therefore visual impacts to recreational users will be avoided. An underground crossing of the Upper Kennebec River would have no impact on the P-RR subdistrict or its intended purpose.

As discussed in CMP's September 27, 2017 Site Law and NRPA applications and as supplemented with the October 19, 2018 application amendments, there is no alternative site which is both suitable for the proposed transmission line use and reasonably available to CMP.

Further analysis of construction feasibility, operational and maintenance considerations, total project cost, and visual and recreational impact of the Underground Transmission Alternative described in the September 27, 2017 application have resulted in the conclusion that an HDD crossing beneath the Upper Kennebec River is both suitable and reasonably available to CMP. The previous preferred overhead crossing of the Upper Kennebec River is no longer suitable for the crossing of the P-RR because it would have greater impacts than the HDD crossing. As described in the September 27, 2017 and October 19, 2018 applications, overhead conductors would be visible to rafters passing through or stopping in this portion of the river, and views of the transmission line structures would occur on the west side of the river with the overhead crossing. This will not occur with the HDD crossing. Nor is the CMP Land Alternative or the Brookfield Alternative suitable or reasonably available, for the reasons stated in the September 27, 2017 applications.

Accordingly, no reasonable alternative to the HDD crossing exists which would have less adverse effect upon the natural and recreational features of this segment of the Kennebec River. In addition, the siting of the HDD installation and termination stations will result in maintained forest on both sides of the river and therefore will be buffered from those uses or resources within the subdistrict with which it is incompatible. The HDD crossing increases the forested buffers on both the east and west sides of the Upper Kennebec River beyond what was proposed for the overhead crossing, thereby avoiding visibility of the Project by recreational users on the river.

### **Appalachian Trail**

The NECEC Project crosses the P-RR subdistrict in three locations at the Appalachian Trail adjacent to Moxie Pond and Trestle Road in Bald Mountain Twp in an existing CMP

corridor containing a 115kV transmission line. See Exhibit CMP-8-J. The P-RR subdistrict in this location includes a 200-foot-wide strip centered over the Appalachian Trail. The configuration of the trail, within and adjacent to an approximately 3,500-foot long portion of transmission line corridor, prevented CMP from avoiding impacts to the subdistrict through the siting of the transmission line structures. As a result, one of five transmission line structures in this portion of the Project corridor is located within the P-RR subdistrict.

Because the existing land use is within the existing transmission line corridor, there will be a negligible change in visual impact to hikers using the trail. Alternative alignments of the transmission line to meet the purpose and need of the Project would result in crossings of the Appalachian Trail in one or more locations where there are no existing transmission line corridors.

#### **V. Conclusion (Relevant to DEP and LUPC Review)**

For the reasons stated above, it is my opinion that there are no reasonable alternatives to the proposed location and character of the transmission line that would lessen its impact on the environment or the risks it would engender to the public health or safety, without unreasonably increasing its cost. There is no less environmentally damaging practicable alternative to the Project that meets its purpose, nor are there reasonable alternatives to those portions of the Project that cross outstanding river segments that would have less adverse effect upon the natural and recreational features of the river segment. Where the Project is located within the P-RR subdistrict, it is my opinion that CMP has shown by substantial evidence that there is no alternative site that is both suitable to the proposed use and reasonably available to CMP.

#### Exhibits:

CMP-8-A: Berube CV

CMP-8-B: HVDC Alternative 1 Map

CMP-8-C: HVDC Alternative 1 Table  
CMP-8-D: HVDC Alternative 2 Map  
CMP-8-E: HVDC Alternative 2 Table  
CMP-8-F: Converter Station Alternative Map  
CMP-8-G: Compensation Tract Location  
CMP-8-H: Beattie Pond Map  
CMP-8-I: HDD Crossing Plans  
CMP-8-J: AT Crossings Figure



Dated:

2/26/2019

Respectfully submitted,

Brian Berube

STATE OF MAINE

Kennebec, ss.

The above-named Brian Berube did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Dated:

February 26, 2019

Before,



Notary Public

Name: Alice RichardsMy Commission Expires: 1/4/2025



CMP-8-A: Berube CV

## Brian R. Berube

83 Edison Drive, Augusta, Maine 04336 | 207.629.2168 | brian.berube@avangrid.com

### EXPERIENCE

#### MANAGER, REAL ESTATE SERVICES

June 2018 — Present

#### AVANGRID SERVICE COMPANY, AUGUSTA, MAINE

Responsible for the procurement, disposition, and management of Corporate and Networks real property assets for all AVANGRID operating companies including Central Maine Power Company

#### SENIOR LEAD ANALYST

March 2015 — May 2018

#### AVANGRID SERVICE COMPANY, AUGUSTA, MAINE

Responsible for integrating and implementing enterprise GIS solutions for outage management, data analytics, field operations, customer service, and emergency preparedness

#### Associate

September 2013 — April 2015

CBRE | The Boulos Company, Portland, Maine

Real Estate Associate responsible for contract negotiations, financial and underwriting analysis, site location development analysis and executing brokerage assignments related to the purchase, sale and leasing of commercial real estate assets

#### GIS Project Manager/Professional Land Surveyor

September 2012 — September 2013

Nadeau Land Surveys, Portland, Maine

Responsible for managing and integrating GIS solutions for clients

#### GIS Analyst/ Land Surveyor Technician

CES, Inc., Brewer, Maine

January 2008 — September 2012

Responsible for managing and integrating GIS solutions for utility, institutional, federal, state, and municipal clients

## EDUCATION

**University of Maine at Orono** — Orono, Maine

December 2008 — May 2011

Master of Business Administration, Finance

**University of Maine at Orono** — Orono, Maine

September 2003 — December 2008

Bachelor of Science, Forest Operations

Minor, Surveying Engineering

Minor, Forest Products

## PROFESSIONAL LICENSES AND CERTIFICATIONS

**Maine Associate Brokers License**

Active Status

License Number: BA919329

**Maine Professional Land Surveyor**

Active Status

License Number: PLS2500

**GIS Professional**

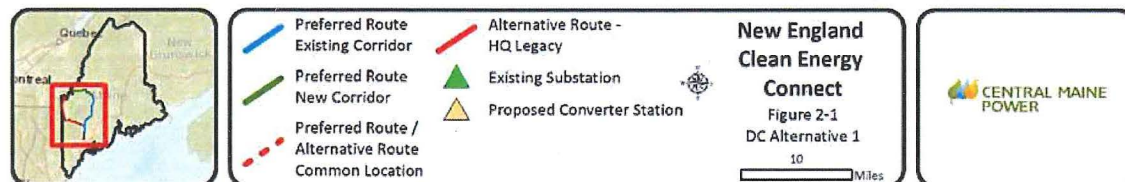
Active Status

Certificate Number: 91819





The map displays the state of Maine with its county boundaries and major towns. A red line traces a proposed transmission line route, starting from the northern border near the Québec border, passing through towns like Bangor, Houlton, and Presque Isle, and then heading south through Lewiston. A blue line shows an existing route, primarily along the coast. A green triangle is placed near the town of Lewiston, indicating the specific location of the proposed transmission line project. Labels for neighboring states (QUÉBEC, NEW HAMPSHIRE) and various towns are visible.



9/21/2017



CMP-8-C: HVDC Alternative 1 Table

| Point of Comparison                      | Unit        | NECEC Preferred Alternative | Alternative 1          |
|------------------------------------------|-------------|-----------------------------|------------------------|
| Conserved Lands                          | count/acres | 6 parcels/42.0 acres        | 8 parcels/ 275.3 acres |
| Undeveloped ROW                          | miles       | 53.5                        | 93.1                   |
| Clearing                                 | acres       | 1,823                       | 1,934                  |
| Parcel Count Total                       | count       | 7                           | 120                    |
| Stream Crossings                         | count       | 115                         | 88                     |
| Transmission Line Length                 | miles       | 146.5                       | 119.3                  |
| NWI Mapped Wetlands                      | count/acres | 263 wetlands / 76.3 acres   | 238/118.3 acres        |
| Deer Wintering Areas                     | count/acres | 8 DWA's/44.3 acres          | 8 DWA's/71.3 acres     |
| Inland Waterfowl and Wading Bird Habitat | count/acres | 12 IWWH / 22.7 acres        | 12 IWWH/ 16.5 acres    |
| Public Water Supplies within 500 feet    | count       | 1                           | 1                      |
| Sand and Gravel Aquifers                 | count       | 12                          | 7                      |









CMP-8-E: HVDC Alternative 2 Table

| <u>Point of Comparison</u>                      | <u>Unit</u> | <u>NECEC Preferred Alternative</u> | <u>Alternative 2</u>  |
|-------------------------------------------------|-------------|------------------------------------|-----------------------|
| <b>Conserved Lands</b>                          | count/acres | 6 parcels/42.0 acres               | 9 parcels/ 53.2 acres |
| <b>Undeveloped ROW</b>                          | miles       | 53.5                               | 17.3                  |
| <b>Clearing</b>                                 | acres       | 1,823                              | 1,670                 |
| <b>Parcel Count Total</b>                       | count       | 7                                  | 34                    |
| <b>Stream Crossings</b>                         | count       | 115                                | 123                   |
| <b>Transmission Line Length</b>                 | miles       | 146.5                              | 138.5                 |
| <b>NWI Mapped Wetlands</b>                      | count/acres | 263 wetlands / 76.3 acres          | 283/113.3 acres       |
| <b>Deer Wintering Areas</b>                     | count/acres | 8 DWA's/44.3 acres                 | 8 DWA's/44.0 acres    |
| <b>Inland Waterfowl and Wading Bird Habitat</b> | count/acres | 12 IWWH / 22.7 acres               | 12 IWWH/ 16.5 acres   |
| <b>Public Water Supplies within 500 feet</b>    | count       | 1                                  | 1                     |
| <b>Sand and Gravel Aquifers</b>                 | count       | 12                                 | 10                    |





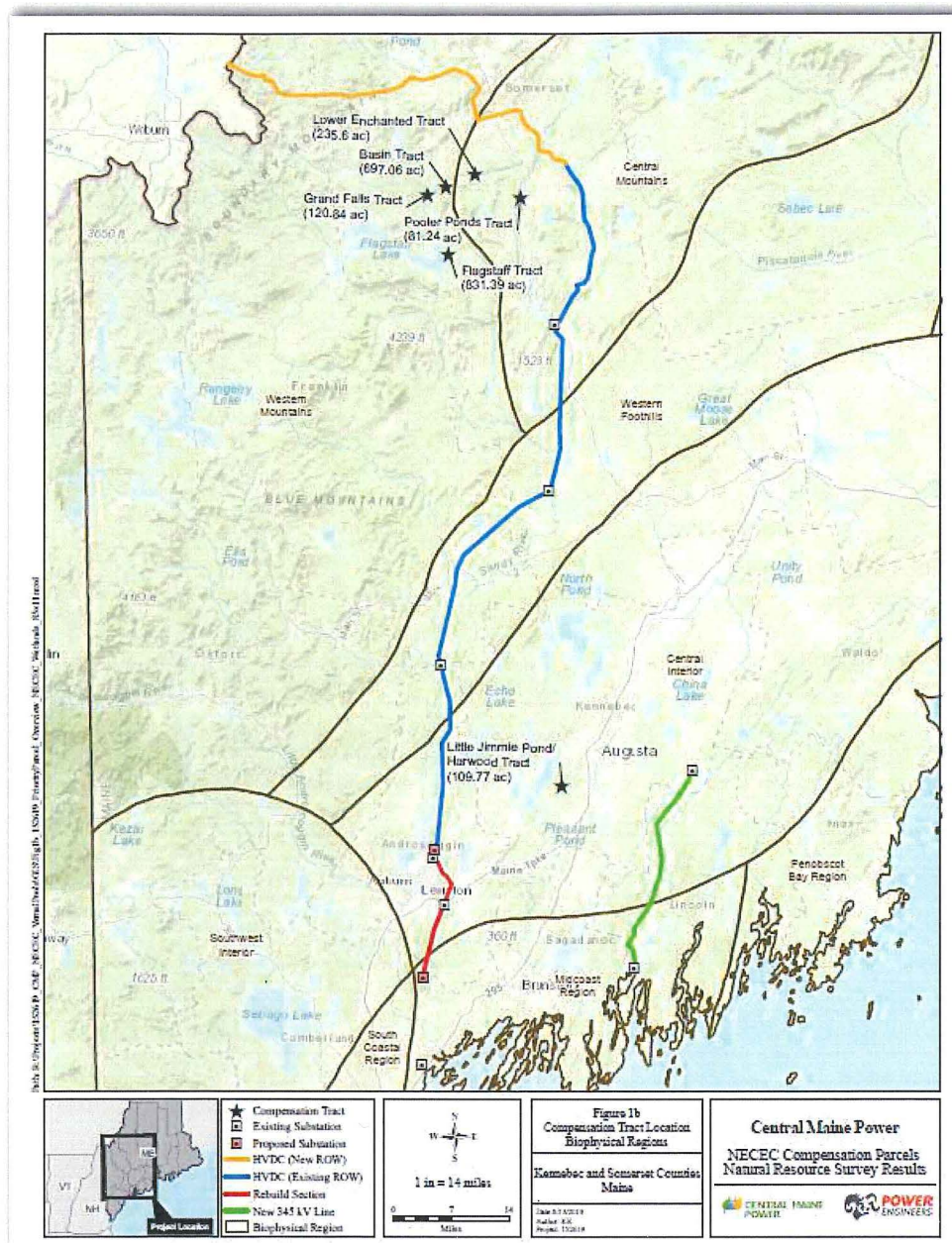
CMP-8-F: Converter Station Alternative Map







## CMP-8-G: Compensation Tract Location

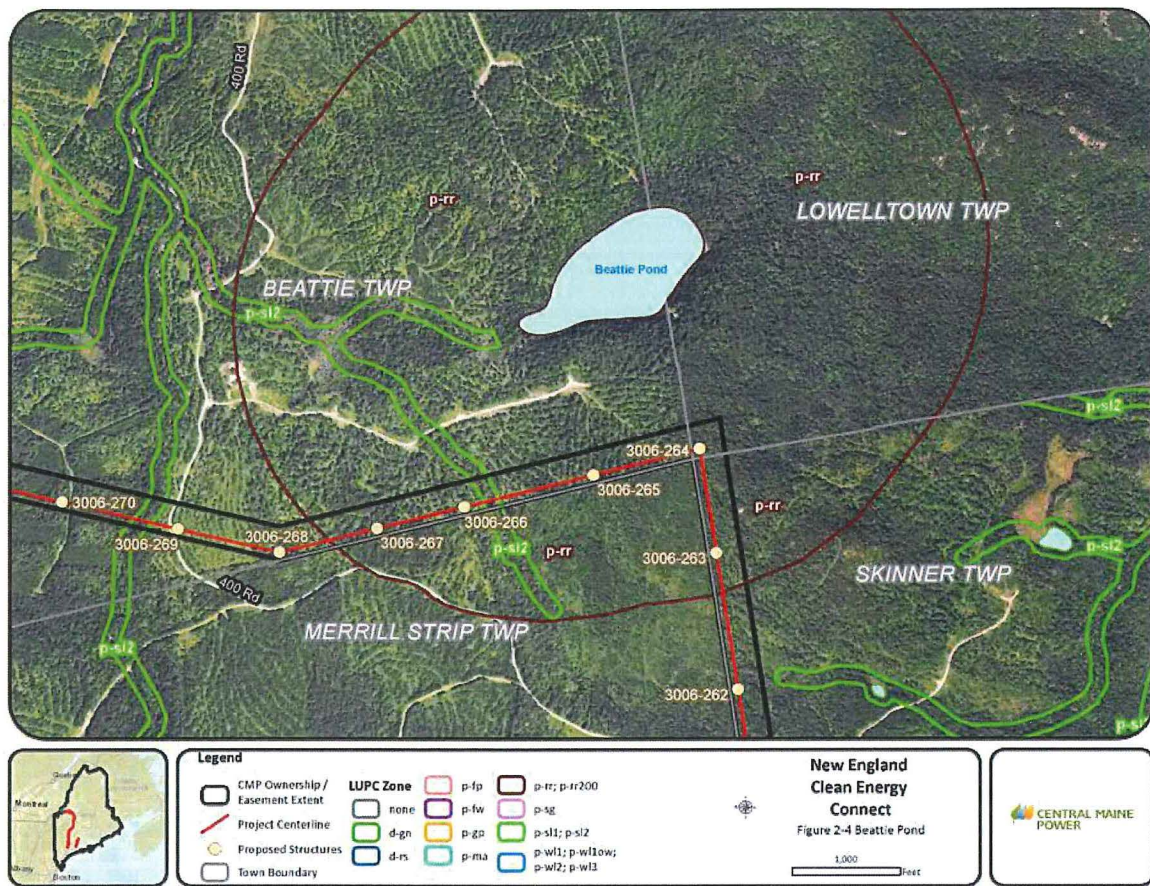


| Tract                        | Dead River Frontage            | Acres           |
|------------------------------|--------------------------------|-----------------|
| <b>Grand Falls Tract</b>     | 1.4 miles (0.7 on each side)   | 120.84          |
| <b>Lower Enchanted Tract</b> | 2.3 miles along the north side | 235.60          |
| <b>Basin Tract</b>           | 4.2 miles along the south side | 697.06          |
| <b>Total</b>                 | <b>7.9 miles</b>               | <b>1,053.50</b> |





## CMP-8-H: Beattie Pond Map



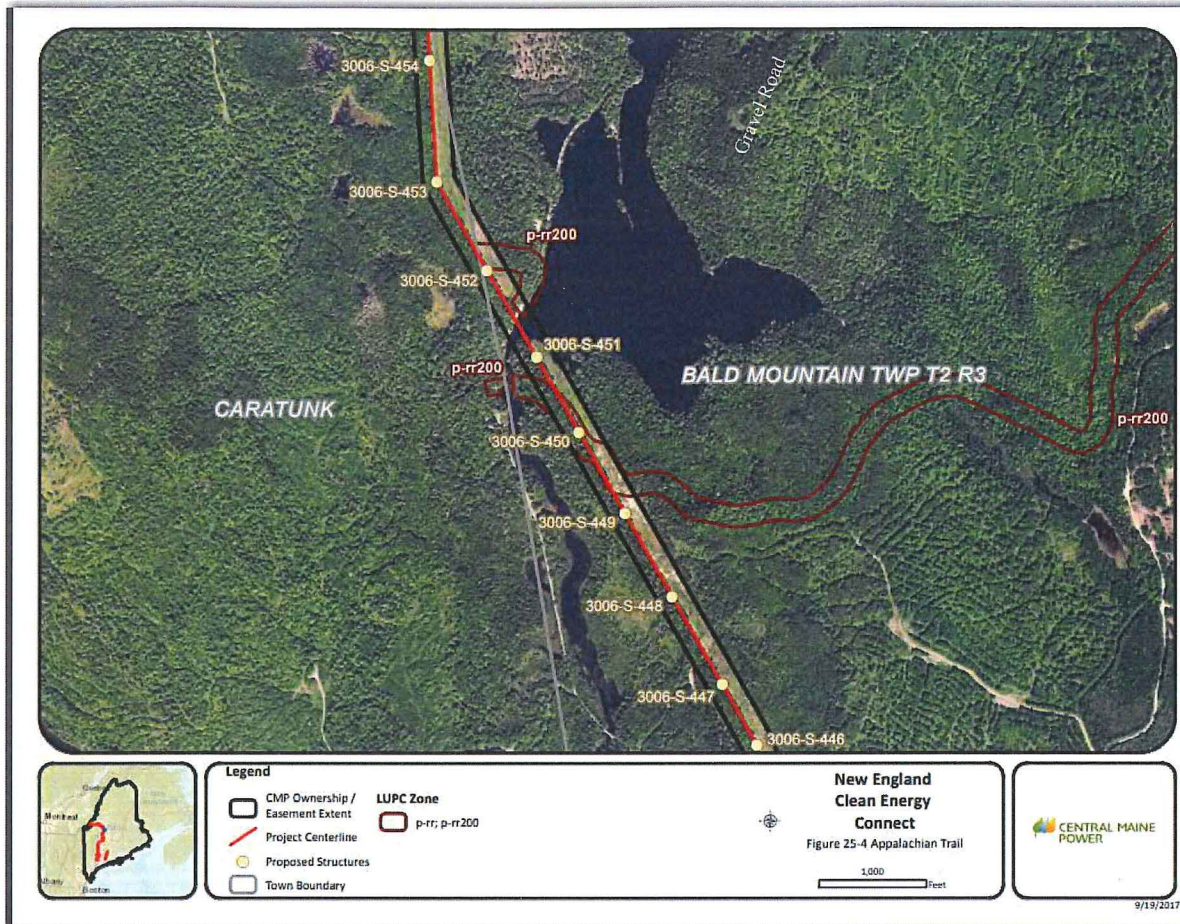


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CMP-8-J: Appalachian Trail Crossings Figure



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**MATTHEW D. MANAHAN**

Merrill's Wharf  
254 Commercial Street  
Portland, ME 04101

**P** 207.791.1189  
**F** 207.791.1350  
**C** 207.807.4653  
mmanahan@pierceatwood.com  
pierceatwood.com

Admitted in: MA, ME, NH

March 25, 2019

James R. Beyer  
Maine Dept. of Environmental Protection  
28 Tyson Drive  
Augusta, ME 04333

Bill Hinkel  
Land Use Planning Commission  
18 Elkins Lane, 4<sup>th</sup> Floor  
Augusta, ME 04333

RE: NECEC – Pre-Filed Rebuttal Testimony of Central Maine Power Company

Dear Jim and Bill:

Enclosed is CMP's Pre-Filed Rebuttal Testimony. Pursuant to the Third Procedural Orders, we are sending, via overnight delivery, the following:

- Original and 4 copies of CMP's Pre-Filed Direct Testimony for the DEP;
- Original and 9 copies of CMP's Pre-Filed Direct Testimony for LUPC.

Sincerely,



Matthew D. Manahan

Enclosure  
cc: Service Lists



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )  
)  
CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED REBUTTAL TESTIMONY  
of

CENTRAL MAINE POWER COMPANY

MARCH 25, 2019

**EXHIBIT LIST FOR PRE-FILED REBUTTAL TESTIMONY  
OF CENTRAL MAINE POWER COMPANY**

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| Underground Cost Estimate, New Corridor Only.....                                                                | CMP-11-C          |
| Underground Cost Estimate, Underground Alternate Route .....                                                     | CMP-11-D          |
| Underground Cost Estimate, AT Crossings.....                                                                     | CMP-11-E          |
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STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
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#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
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Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED REBUTTAL TESTIMONY OF THORN DICKINSON

March 25, 2019

Regarding

- Issue 3: Alternatives Analysis
  - Responsive to Intervenor Group 8 (NextEra) witness Christopher Russo
  - Responsive to Intervenor Group 2 (Town of Caratunk) witness Elizabeth Caruso
  - Responsive to Intervenor Group 6 (The Nature Conservancy) witnesses Rob Wood, Andrew Cutko, and Bryan Emerson

## **I. Discussion (Relevant to DEP and LUPC Review)**

This testimony is in response to the direct testimony of Christopher Russo on behalf of NextEra Energy Resources (“NextEra”), and portions of the direct testimony of Elizabeth Caruso of the Town of Caratunk and the direct testimony of Rob Wood, Andrew Cutko, and Bryan Emerson on behalf of The Nature Conservancy (“TNC”), relating to the purported alternative of installing portions of the New England Clean Energy Connect (“NECEC” or “Project”) transmission line underground. Mr. Russo provided testimony to the Department of Environmental Protection (“DEP”) and the Land Use Planning Commission (“LUPC”) asserting that during the planning of the NECEC Project there was a “failure to consider undergrounding the New England Clean Energy Connect (“NECEC”) high voltage direct current (“HVDC”) transmission line.”<sup>1</sup> Furthermore, Mr. Russo asserted that “[f]ailure to evaluate an undergrounded the [*sic*] HVDC transmission line means that CMP has failed to establish that ‘there is no alternative site which is both suitable to the proposed use and reasonably available to the applicant’ as required for portions of the NECEC within the Commission’s P-RR subdistrict.”<sup>2</sup> Ms. Caruso also testified that CMP should have but did not consider the alternative of burying the HVDC line underground.<sup>3</sup> And finally, TNC’s direct testimony proposed that DEP should consider an alternative to the NECEC proposal that includes additional portions of the HVDC line to be buried in Segment 1 of the transmission line corridor.<sup>4</sup>

Contrary to opponents’ claims, burying the NECEC HVDC line underground in the 54-mile new corridor portion is not reasonable or feasible because the costs of doing so would

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<sup>1</sup> Feb. 28, 2019 Pre-Filed Direct Testimony of Christopher Russo at page 2.

<sup>2</sup> *Id.* at 2.

<sup>3</sup> Feb. 28, 2019 Pre-Filed Direct Testimony of Elizabeth Caruso at 6-10.

<sup>4</sup> Feb. 28, 2019 Pre-Filed Direct Testimony of Rob Wood, Andrew Cutko, and Bryan Emerson at 7.

defeat the purpose of the Project. In determining whether the NECEC Project causes an unreasonable impact to the environment, DEP considers whether there are practicable alternatives to the proposed activity. Practicable is a defined term – it does not mean any available alternative. Rather, DEP defines practicable as “[a]vailable and feasible considering cost, existing technology and logistics based on the overall purpose of the project.”<sup>5</sup> Similarly, in making its allowed use determination, LUPC must evaluate whether the applicant has shown by substantial evidence that “there is no alternative site which is both suitable to the proposed use and reasonably available to the applicant” for portions of the Project within a P-RR subdistrict.<sup>6</sup> As with DEP’s review, in considering suitability and reasonable availability, LUPC necessarily must consider cost, existing technology, and logistics based on the overall purpose of the Project.

As I stated in my Pre-Filed Direct testimony, the overall purpose of the NECEC is to deliver up to 1,200 MW of renewably-generated electricity from Québec to the ISO-NE electric grid at the lowest cost for ratepayers.<sup>7</sup> To construct an HVDC transmission line capable of delivering 1,200 MW of clean energy, the Project must have a mechanism by which CMP, or a CMP affiliate owning the line, can recover its costs and investment in building, operating, and maintaining the transmission line. Without such a cost-recovery mechanism, the NECEC would not move forward and the Project purpose of delivering 1,200 MW of clean energy to ISO-NE would not be met.

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<sup>5</sup> DEP Reg. 310.3(R); 315.5(G); 335.2(D).

<sup>6</sup> LUPC Reg. 10.23,I(3)(d).

<sup>7</sup> Feb. 28, 2019 Pre-Filed Direct Testimony of Thorn Dickinson at 3; Feb. 28, 2019 Pre-Filed Direct Testimony of Brian Berube at 4.

In the current transmission development market in New England, the only feasible way to obtain cost recovery for a transmission line with sufficient size to transport 1,200 MW of energy from Québec to New England, like the NECEC, is to bid the transmission line in conjunction with a clean energy resource, like Hydro-Québec, in response to a competitive solicitation. In fact, in the last few years several New England states have issued competitive solicitations for clean energy that allowed for the possibility of recovering the costs associated with the transmission development to bring the energy to market, including the 2016 Tri-State RFP, Massachusetts' 2017 Section 83D RFP, Massachusetts' 2017 Section 83C RFP, and the more recent 2018 Connecticut RFP and 2018 Rhode Island RFP.<sup>8</sup>

Avangrid and CMP developed the NECEC Project in response to the 2017 Massachusetts Section 83D RFP seeking 9,450,000 megawatt hours ("MWhs") of Clean Energy Generation to be procured under long-term contracts.<sup>9</sup> Under the portion of the Massachusetts Energy Diversity Act referred to as Section 83D, the Massachusetts legislature, among other things,

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<sup>8</sup> Request for Proposals for Long-Term Contracts for Clean Energy Projects (Mar. 31, 2017) (Section 83D RFP) *available at* <https://macleanenergy.files.wordpress.com/2017/03/83d-rfp-and-appendices-final.pdf>; Request for Proposal for Long-Term Contracts for Offshore Wind Energy Projects (June 29, 2017) ("Section 83C RFP") *available at* <https://macleanenergy.files.wordpress.com/2017/02/section-83c-request-for-proposals-for-long-term-contracts-for-offshore-wind-energy-projects-june-29-2017.pdf>; Notice of Request for Proposal from Private Developers for Clean Energy and Transmission (Nov. 12, 2015) ("Tri-State RFP") (no longer available online); Request for Proposal for Long-Term Contracts for Renewable Energy (Sept. 12, 2018) ("RI RFP"), *available at* [https://ricleanenergyrfp.files.wordpress.com/2018/09/2018-ri-ltc-rfp\\_draft-04-20-2018revd-08-31-2018-clean-copy.pdf](https://ricleanenergyrfp.files.wordpress.com/2018/09/2018-ri-ltc-rfp_draft-04-20-2018revd-08-31-2018-clean-copy.pdf); Notice of Request for Proposals From Private Developers For Zero Carbon Energy (July 31, 2018) ("CT RFP"), *available at* [http://www.dpuc.state.ct.us/DEEPEnergy.nsf/c6c6d525f7cdd1168525797d0047c5bf/f18419651b249e2e852582db006cbca3/\\$FILE/2018.08.1\\_FINAL%20RFP%20-%20updated.pdf](http://www.dpuc.state.ct.us/DEEPEnergy.nsf/c6c6d525f7cdd1168525797d0047c5bf/f18419651b249e2e852582db006cbca3/$FILE/2018.08.1_FINAL%20RFP%20-%20updated.pdf).

<sup>9</sup> Feb. 28, 2019 Pre-Filed Direct Testimony of Thorn Dickinson at 3.



directed the Massachusetts Electric Distribution Companies (“Massachusetts EDCs”)<sup>10</sup> to jointly and competitively solicit proposals for and to enter into cost-effective long-term contracts for Clean Energy Generation and related Environmental Attributes in an annual amount of 9,450,000 MWh, provided that such long-term contracts are approved by the Massachusetts Department of Public Utilities (“MA DPU”).<sup>11</sup> Section 83D also directed the MA DPU to adopt regulations requiring the transmission costs associated with a proposal to be incorporated into the bid, provided that, to the extent there are transmission costs included in a bid, the MA DPU may authorize or require the relevant parties to seek recovery of such transmission costs of the project through federal transmission rates, consistent with policies and tariffs of the Federal Energy Regulatory Commission (“FERC”), to the extent the MA DPU finds such recovery is in the public interest.<sup>12</sup>

To that end, the Section 83D RFP ultimately issued by the Massachusetts EDCs placed significant emphasis on cost containment of the transmission costs associated with responsive proposals. In fact, under Section 83D the RFP’s Phase 1 initial criteria for the evaluation of the eligibility of proposals, the RFP encouraged bidders to propose fixed pricing for the transmission portion and mandated that all transmission pricing proposals include cost containment features such as other fixed price components, cost overrun restrictions, and other cost bandwidth

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<sup>10</sup> The Massachusetts EDCs are Fitchburg Gas & Electric Light Company d/b/a Unitil; Massachusetts Electric Company d/b/a National Grid; Nantucket Electric Company d/b/a National Grid; NSTAR Electric Company d/b/a Eversource; Western Massachusetts Electric Company d/b/a Eversource, as investor-owned electric distribution companies.

<sup>11</sup> 2008 MASS. ACTS Ch. 169 § 83D(a).

<sup>12</sup> 2008 MASS. ACTS Ch. 169 § 83D(d)(4); *see also* 220 CMR § 24.05.

provisions.<sup>13</sup> The RFP also indicated that “the bids that limit customer risk to a greater degree will be viewed more favorably.”<sup>14</sup>

Similar cost containment admonitions were reiterated in the subsequent Phase 1 RFP criteria for the threshold requirements review, which stated that “[i]n order to be considered, transmission bidders must include significant cost containment features in their proposals, and proposals that include more effective provisions that eliminate or minimize ratepayer exposure to transmission cost risks as described in this section will be evaluated more favorably throughout the evaluation process.”<sup>15</sup> Each bidder was also required to submit a “detailed explanation of how its proposal mitigates transmission costs, and ensures that transmission cost overruns, if any, are not borne by ratepayers.”<sup>16</sup> The RFP made it clear that under this phase of the review, the Massachusetts EDCs could decline to pursue a proposal if the proposal’s terms and conditions would place an unreasonable burden on the Massachusetts EDCs’ balance sheet.<sup>17</sup>

The RFP also made clear that transmission cost containment would weigh heavily in the Phase 2 Quantitative and Qualitative Evaluation of RFP bids. Under the RFP’s quantitative analysis, proposals were evaluated and ranked using a multi-year net present value analysis to determine whether the proposal was “economically competitive” when compared to other proposals.<sup>18</sup> The RFP explained that the quantitative ranking was based on the direct and indirect economic and environmental costs and benefits of the proposal based on a combination

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<sup>13</sup> 83D RFP § 2.2.1.4(ii)(b) at 16.

<sup>14</sup> *Id.*

<sup>15</sup> *Id.* at § 2.2.2.6 at 25.

<sup>16</sup> *Id.* at § 2.2.2.6.1 at 26.

<sup>17</sup> *Id.* at § 2.2.2.12 at 31.

<sup>18</sup> *Id.* at § 2.3.1.

of its direct contract price cost and benefits and other costs and benefits to retail customers.<sup>19</sup>

Proposals that were not economically competitive did not proceed to the qualitative evaluation.<sup>20</sup>

So too did the RFP make clear that cost factors were a primary evaluation criterion in the subsequent qualitative analysis, stating that the Massachusetts EDCs would evaluate the proposal's benefits, costs, and contract risk by considering the "[e]xtent to which pricing is firm and/or the cost containment measures effectively limit cost risk for customers."<sup>21</sup> The RFP described that following the conclusion of the RFP Phase 2 quantitative and qualitative evaluation process, the evaluation team would determine which proposals would proceed to the Phase 3 evaluation process based on three considerations: (1) the rank order of the proposals at the end of the Phase Two evaluation; (2) the cost effectiveness of the proposals based on the Phase Two quantitative evaluation; and (3) the total annual MWh/year quantities of the proposal(s), relative to the annual procurement target.<sup>22</sup>

Under the RFP Phase 3 Portfolio Analysis, the final stage of the evaluation, the RFP made clear that the evaluation team would evaluate the proposals based on the Phase 2 ranking, as well as additional factors including the overall cost effectiveness of the various portfolio of proposals, any risks to customers that may be associated with projects proposing to recover transmission costs through transmission rates not fully captured in the Phase 2 evaluation, and any additional benefits to customers not fully captured in the Phase 2 evaluation.<sup>23</sup>

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<sup>19</sup> *Id.* at §§ 2.3.1, 2.3.1.1, 2.3.1.3 at 31-33.

<sup>20</sup> *Id.* at § 2.3.1 at 31.

<sup>21</sup> *Id.* at § 2.3.2(vi) at 35.

<sup>22</sup> *Id.* at § 2.3.2(viii) at 36.

<sup>23</sup> *Id.* at § 2.4 at 36-37.

With this evaluation framework, which was similar to the evaluation framework used for the prior 2016 Tri-State RFP, CMP and Avangrid designed the NECEC Project to be as competitive as possible. These efforts included both minimizing costs to help ensure that the NECEC was selected in the competitive solicitation process and minimizing impacts where practicable in an effort to help ensure that the Project could obtain the requisite regulatory authorizations and permits and ultimately come to fruition, all while maintaining the quality and safety of the Project consistent with CMP and Avangrid's standards and good utility practice.

At the time the NECEC was designed and proposed in response to the Section 83D RFP, incorporating the costs associated with burying the NECEC transmission line, or portions of the transmission line, into the NECEC proposal would have resulted in the Project not being cost competitive relative to the other proposals. This would have defeated the Project's purpose because it would not have been selected in either the MA Section 83D RFP, or another similar competitive solicitation process. In fact, the importance of cost as a factor in the ultimate selection of the NECEC as the winning bidder in the Section 83D RFP is shown in the results of the Evaluation Team's Phase 2 and Phase 3 analyses of the proposals, which were attached to the evaluation report of the Massachusetts EDCs' consultant, Tabors Caramanis Rudkevich ("TCR"), and were replicated in the evaluation report of the Massachusetts Department of Energy Resources ("MA DOER") Independent Evaluator ("Independent Evaluator's Report"), which is attached to this Rebuttal Testimony as Exhibit CMP-1.1-A.<sup>24</sup>

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<sup>24</sup> The Massachusetts EDCs hired TCR to evaluate the costs and benefits of the Section 83D contract bids and TCR's work was overseen by an independent evaluator, Peregrine Energy Group (Independent Evaluator), which was retained by the MA DOER. Both TCR and the Independent Evaluator produced a report describing the costs and benefits of the various Section 83D contract bids. The Independent Evaluator's Report is attached hereto as Exhibit CMP-1.1-A (8/07/18 Independent Evaluator Report from Peregrine Energy Group on the Solicitation,



As shown in the Independent Evaluator’s Report at Appendices D (Phase 2 Evaluation for Large Projects) and F (Phase 3 Evaluation for Large Projects), the NECEC Project was ranked third in total score at the end of the Phase 2 evaluation and ranked first at the end of the Phase 3 portfolio evaluation.<sup>25</sup> In light of the fact that the competing New England Clean Power Link project in Vermont proposed by TDI New England (the “TDI Project”) and the Northern Pass Transmission Project in New Hampshire proposed by Eversource (the “Northern Pass Project”) had similar benefits with respect to achieving the Massachusetts’ renewable energy policy goals,<sup>26</sup> the inclusion of the costs of underground construction in the NECEC Project bid would have made the NECEC Project materially less beneficial and therefore less competitive. In fact, the EDC’s final Phase 3 analysis at Appendix F of Exhibit CMP-1.1-A, shows that the difference in net total benefits per MWh between the No. 1 ranked NECEC Hydro Project and the No. 2 ranked project was \$1.59 per MWh (\$40.02 NECEC Hydro Project - \$38.43 Portfolio 12 Project).

The attached analysis provided as Exhibit CMP-1.1-B demonstrates the impact on the NECEC proposal in the Section 83D rankings had the Project included an underground HVDC line for the 54-mile new corridor section. If the NECEC proposal had included an underground

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Evaluation, Bid Selection and Contract Negotiation Process under Section 83D of the Green Communities Act (revised, redacted) (hereinafter the “Independent Evaluator’s Report”).

<sup>25</sup> Independent Evaluator’s Report, Exhibit CMP-1.1-A, at 72, 74 of 75 (Appendices D and F).

<sup>26</sup> Response To Request For Proposals For Long-Term Contracts For Clean Energy Projects Submitted By Hydro Renewable Energy Inc. (HRE), an affiliate of Hydro-Québec, and Northern Pass Transmission LLC (NPT), *available at* <https://macleanenergy.com/83d/83d-bids/> (public versions of the Section 83D RFP submissions for the Northern Pass Project); Proposal in Response to Request for Proposals for Long Term Contracts for Clean Energy Projects dated March 31, 2017 from Joint Bidders Hydro Renewable Energy Inc. and Champlain VT, LLC d/b/a TDI New England, *available at* <https://macleanenergy.com/83d/83d-bids/>. (public versions of the Section 83D RFP submissions for the TDI Project).

HVDC transmission line, the transmission portion of the contract cost would have increased by \$9.00 per MWh, resulting in an \$9.00 per MWh reduction in the net direct benefit and a net total benefit of \$31.02 per MWh (reflected in real levelized 2017 dollars per MWh). As shown in Exhibit CMP-3.1-A, Appendix F, if the net total benefit of the NECEC had been \$31.02 per MWh, the Project would have received a ranking of 9th, nowhere near the net total benefit needed to be competitive with the other projects in the selection process.

Accordingly, if the NECEC Project had included an underground HVDC transmission line, it would not have been selected by the Massachusetts EDCs in the Section 83D RFP, thereby defeating the purpose of the Project.

This conclusion is borne out by the TDI Project identified in Mr. Russo's testimony, which proposed a 154-mile underground/underwater HDVC transmission line to transport a similar amount of clean hydropower energy from Hydro-Québec into ISO-NE through Vermont,<sup>27</sup> and which has all of its material permits and authorizations but was not selected in the Section 83D RFP process, in large part because it was too expensive and imposed too great a financial burden on Massachusetts ratepayers.

Accordingly, CMP did not include an underground HVDC line in the NECEC Section 83D RFP proposal because to do so was not suitable, reasonable, or practicable, where the cost of including the underground line would have defeated the purposes of the NECEC, which is to produce a project that not only is designed to transport 1,200 MW of clean energy to New England, but is actually able to get built because there is a mechanism to recover the costs and investment of constructing, operating, and maintaining the transmission line.

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<sup>27</sup> Feb. 28, 2019 Pre-Filed Direct Testimony of Christopher Russo at 4.

Now that the NECEC has been selected in the Massachusetts Section 83D RFP, and the associated transmission service agreements with fixed price transmission rates have been executed with the Massachusetts EDCs and approved by FERC, any additional project costs will be borne by CMP (or an affiliate owner of the Project) and its investors, and will not be recovered from the Massachusetts EDCs or from any other transmission customers. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

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- I [REDACTED]
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I [REDACTED]



[REDACTED]

[REDACTED]

[REDACTED]

Should DEP or LUPC require that the NECEC Project HVDC transmission line be buried for the length of the 54-mile new corridor section running from the Québec-Maine border to Moxie Gore, or even for a portion of that section, the additional cost would undermine the Project's viability. As indicated in the Rebuttal Testimony of Justin Bardwell, the inclusion of an underground HVDC line for the 54-mile new corridor section would add \$644.6 million to the total cost of the Project, which, factoring in the allowance for funds used during construction ("AFUDC"), would actually total \$767.9 million. These additional costs would need to be paid prior to the NECEC COD and would not be recoverable from the Maine electricity customers, the Massachusetts EDCs, or Massachusetts ratepayers.<sup>29</sup> Therefore, the alternative of burying the transmission line is not practicable or reasonably available because it would result in the NECEC not moving forward because this cost could not be recovered. In other words, it would make the Project uneconomic and thereby would defeat the purpose of the NECEC, which is to deliver 1,200 MW of clean energy from Québec to New England.

Furthermore, as addressed in the testimony of Justin Bardwell, the alternative of burying the HVDC line in even a portion or portions of the new corridor section running from the Québec-Maine border to Moxie Gore is not a practicable, or a suitable or reasonably available alternative, due to the extremely high cost, limited environmental benefits, increased risk and impacts during construction, and potential adverse operational impacts during operation. .

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<sup>29</sup> Pre-Filed Rebuttal Testimony of Justin Bardwell at Section C.1.

## **II. Conclusion (Relevant to DEP and LUPC Review)**

For the foregoing reasons, burying the NECEC HVDC line underground in the 54-mile new corridor portion is neither reasonable, available, nor feasible, as the costs of doing so would defeat the purpose of the Project. Accordingly, it is not a practicable alternative, is not suitable to the proposed use, and is not reasonably available to CMP.

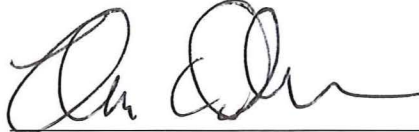
### Exhibits:

CMP-1.1-A: Independent Evaluator's Report

CMP-1.1-B: Analysis of Impact of 54-Mile Underground Line on NECEC Transmission Rate and Section 83D Ranking

Dated: 3/18/19

Respectfully submitted,

Thorn Dickinson

STATE OF MAINE

Cumberland, ss.

The above-named Thorn Dickinson did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

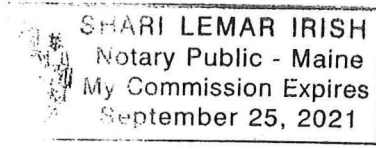
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Dated: 3/18/2019Shari Lemar Irish

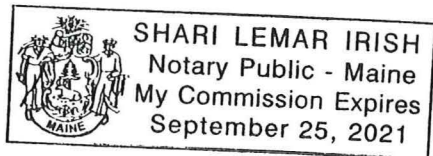
Notary Public

Name:

My Commission Expires:



SHARI LEMAR IRISH  
Notary Public - Maine  
My Commission Expires  
September 25, 2021

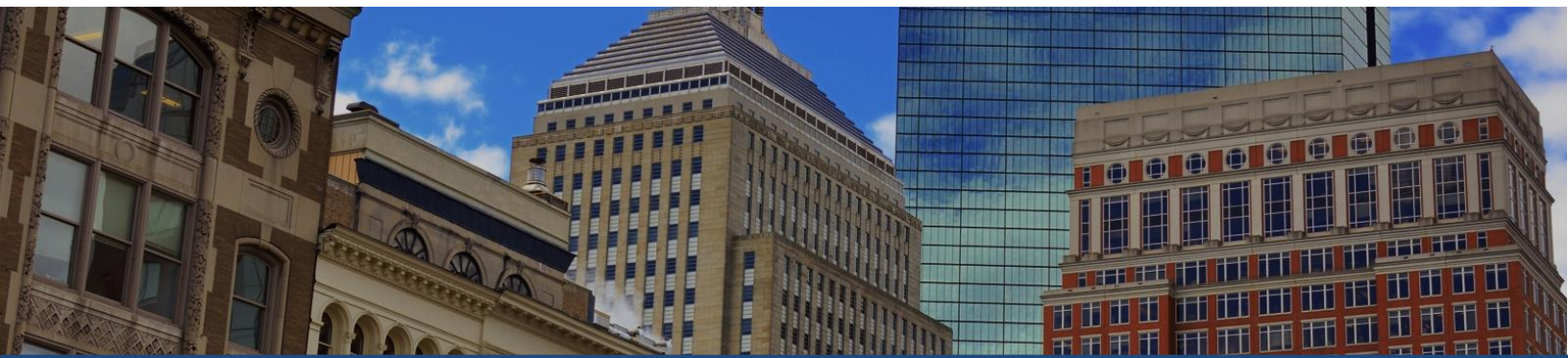


SHARI LEMAR IRISH  
Notary Public - Maine  
My Commission Expires  
September 25, 2021





REDACTED



# Independent Evaluator Report

on the Solicitation, Evaluation, Bid Selection and Contract Negotiation Process  
under Section 83D of the Green Communities Act

Prepared by Peregrine Energy Group

July 24, 2018

Revised August 7, 2018



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## I. Introduction and Executive Summary

On March 31, 2017, Fitchburg Gas & Electric Light Company d/b/a Unitil (“Unitil”), Massachusetts Electric Company and Nantucket Electric Company d/b/a National Grid (“National Grid”), NSTAR Electric Company and Western Massachusetts Electric Company d/b/a Eversource (“Eversource”), as investor-owned electric distribution companies (collectively, “Distribution Companies” or “EDCs” and each a “Distribution Company”), in coordination with the Massachusetts Department of Energy Resources (“DOER”), issued a Request for Proposals (“RFP”) pursuant to which the Distribution Companies would solicit proposals for incremental Clean Energy Generation and associated environmental attributes and/or renewable energy certificates (“RECs”) under long-term contracts, which may include associated transmission costs, pursuant to Section 83D of Chapter 169 of the Acts of 2008 (the “Green Communities Act” or “GCA”), as amended by chapter 188 of the Acts of 2016, An Act to Promote Energy Diversity (the “Energy Diversity Act”) (hereinafter, “83D”). The Department of Public Utilities (the “Department”) approved the issuance of the RFP in an order issued on March 27, 2017.<sup>1</sup>

Bids were submitted with respect to 53 proposed projects on or by July 27, 2017, the due date for proposals.<sup>2</sup> Following an extensive evaluation process, on January 25, 2018, an all-hydro bid submitted by an affiliate of Hydro Quebec, Hydro Renewable Energy Inc. (“HRE”), to be delivered through a new transmission project developed by Northern Pass Transmission LLC (“Northern Pass” or “NPT”), an Eversource affiliate, was selected for contract negotiations. A week later, however, the New Hampshire Site Evaluation Committee (“NHSEC”) decided on February 1, 2018 to deny the New Hampshire siting permit for the Northern Pass project.<sup>3</sup> Subsequently, the Distribution Companies conditionally selected another high-ranking bid for contract negotiations, while continuing to negotiate with Northern Pass, with the ability to cease discussions with NPT and terminate its conditional selection by March 27, 2018.<sup>4</sup> HRE was also the power supplier for the competing bid with transmission delivery through a proposed high-voltage direct current transmission (“HVDC”) project—the New England Clean Energy Connect (“NECEC”) project—whose U.S. segment would be constructed by Central Maine Power Company (“CMP”). On March 28, 2018, the Distribution Companies terminated negotiations with Northern Pass and continued their negotiations with NECEC and HRE,<sup>5</sup> which ultimately led to concluded agreements. These agreements—(a) Power Purchase Agreements (“PPAs”) between the EDCs and a Hydro Quebec subsidiary, H.Q. Energy Services (U.S.) Inc. (“HQUS”)<sup>6</sup> and (b) Transmission Service

<sup>1</sup> Fitchburg Gas and Electric Light Company, et al, D.P.U. 17-32 (2017).

<sup>2</sup> This number does not include pricing variants for proposed projects. This number also differs from the 46 bids referenced on the RFP website, <https://macleanenergy.com/83d/83d-bids/>, which was based upon the number of CDs (public versions) submitted by bidders, some of which contained multiple project proposals.

<sup>3</sup> [https://www.nhsec.nh.gov/projects/2015-06/transcripts/2015-06\\_2018-02-01\\_transcript\\_delib\\_day3\\_pm.pdf](https://www.nhsec.nh.gov/projects/2015-06/transcripts/2015-06_2018-02-01_transcript_delib_day3_pm.pdf).

<sup>4</sup> See <https://macleanenergy.files.wordpress.com/2018/02/doer-statement-update-2-16-18.pdf>.

<sup>5</sup> <https://macleanenergy.com/2018/03/28/83d-selection-update-march-28-2018/>.

<sup>6</sup> During the contract negotiation stage, the parties agreed that HQUS would replace HRE as the seller. Both HQUS and HRE are affiliates of Hydro Quebec. HQUS is an operating U.S. subsidiary that coordinates Hydro Quebec’s business development and energy marketing activities

Agreements (“TSAs”) between the EDCs and CMP—have been filed for approval with the Department; the TSAs between CMP and the Distribution Companies will also be filed by CMP with the Federal Energy Regulatory Commission (“FERC”).

83D requires that DOER and the Attorney General’s Office (“AGO”) jointly select, and DOER shall contract with, an independent evaluator to monitor and report on the solicitation and bid selection process (Section 83D(f)). Pursuant to that authority, Peregrine Energy Group, Inc. (“Peregrine”) was selected to be the Independent Evaluator (the “IE”) with respect to the 83D solicitation (as well as for the first solicitation for offshore wind generation conducted under Section 83C of the Act).<sup>7</sup>

Section 83D(f) states that the purpose of the Independent Evaluator is to help to “ensure an open, fair and transparent solicitation and bid selection process that is not unduly influenced by an affiliated company” and to assist the Department in its consideration of long-term contracts filed for approval. Among the IE’s responsibilities include the obligation to “file a report with the department of public utilities summarizing and analyzing the solicitation and bid selection process, and providing its independent assessment of whether all proposals were evaluated in a fair and non-discriminatory manner.”<sup>8</sup> The IE’s role in the 83D RFP was also expanded at the request of DOER, with the approval of the EDCs, to include monitoring of the post-selection part of the process, including contract negotiations.<sup>9</sup>

This is the IE report that summarizes the solicitation, bid evaluation and bid selection process. In addition, it addresses the oversight of the contract negotiation process that the IE performed to assist DOER with respect to DOER’s contract monitoring role in the process.

In this report, the Independent Evaluator summarizes the development of the RFP and the Department’s approval of its issuance, the Evaluation Team’s subsequent development of a detailed evaluation framework, the receipt of bids, the evaluation of bids, bid selection, and the contract negotiation process leading up to the execution of contracts with HQUS and CMP. In addition, the report contains the IE’s assessment of the solicitation process and results in the context of whether the solicitation process and bid evaluation and selection were conducted objectively and in a fair and non-discriminatory manner without undue preference toward any affiliated projects. In the report, the IE has

in the Northeastern United States. HRE, an indirect wholly-owned subsidiary of Hydro Quebec, was established for the export of Hydro Quebec hydropower but does not (based on our understanding) currently engage in the purchase and sale of electric energy.

<sup>7</sup> Peregrine’s Independent Evaluator team includes subcontractors New Energy Opportunities, Inc., Merrimack Energy Group, Inc., Power Consulting Services, LLC, and Meaden & Moore, LLP. A short summary of the IE team’s qualifications and pertinent experience is set forth in Appendix A to this report.

<sup>8</sup> 83D(f).

<sup>9</sup> See <https://macleanenergy.com/2018/03/28/83d-selection-update-march-28-2018/>.

drawn upon precedents of the FERC under the *Edgar-Allegheny* line of cases as guidance in conducting its assessment.<sup>10</sup>

This solicitation was a very complex, difficult and lengthy process due to the very different resources and products that were eligible to bid, the magnitude of energy sought—approximately 9,450,000 MWh/year—the participation of multiple Distribution Companies and DOER on an Evaluation Team which aimed to operate on a consensual basis, and the fact that two of the Distribution Companies were affiliated with certain bidders. Allowable bids included firm power from existing hydroelectric resources associated with new transmission projects that competed with unit-contingent intermittent power from new wind and solar Renewable Portfolio Standard (“RPS”) Class I generating facilities, as well as with combinations of these types of resources. Adding to the complexity were changes occurring during the solicitation process after the issuance of the RFP—the promulgation of the Clean Energy Standard (“CES”) regulations by the Massachusetts Department of Environmental Protection (“DEP”), which created new and additional demand for clean energy resources and ISO New England’s proposal, and receipt of FERC approval for, a cluster study interconnection process applicable to certain generation and transmission projects in Maine.

The process was not perfectly conducted, and this report addresses some of the issues that had to be addressed along the way. However, overall, the process was properly and fairly conducted, the bid selection decisions were reasonable and in accordance with RFP criteria, and the resulting contracts were fairly negotiated, in the IE’s opinion.

## II. Background: 83D and the Role of the IE

### A. The Energy Diversity Act

Section 83D of the Act, signed into law by Governor Baker on August 8, 2016, provides that in order to facilitate the financing of clean energy generation resources, each Massachusetts electric distribution company shall jointly and competitively solicit proposals for clean energy generation and, provided that reasonable proposals have been received, shall enter into cost effective long-term contracts for “clean energy generation” for an annual amount of electricity equal to approximately 9,450,000 megawatt-hours (“MWh”) by December 31, 2022. “Clean energy generation” is defined under Section 83B of the Act as either:

<sup>10</sup> The *Edgar-Allegheny* guidelines were enunciated by FERC in *Boston Edison Electric Co. Re: Edgar Electric Energy Co.*, 55 FERC ¶ 61,382 (1991) and *Allegheny Electric Supply Company, LLC*, 108 FERC ¶ 61,082 (2004).

1. Firm service hydroelectric generation from hydroelectric generation alone (which may include multiple hydroelectric run-of-river generating units managed in a portfolio that creates firm service through the diversity of multiple units);
2. New RPS Class I eligible resources;<sup>11</sup> or
3. New RPS Class I eligible resources that are firmed up with firm service hydroelectric generation.

Aside from these three classes of generation resources, Section 83D allows “associated transmission costs to be incorporated into a proposal; provided that, to the extent there are transmission costs included in a bid, the department of public utilities may authorize or require the contracting parties to seek recovery of such transmission costs of the project through federal transmission rates, consistent with policies and tariffs of the Federal Energy Regulatory Commission, to the extent the department finds such recovery is in the public interest.”<sup>12</sup> Hence, several very different types of proposals are allowable under 83D:

- Firm service hydroelectric generation under a PPA;
- New Class I RPS generation, such as wind or solar, firmed by firm service hydroelectric generation under a PPA;
- New Class I renewables, such as wind or solar, under a PPA;
- Any of the foregoing types of generation under PPAs plus transmission under a long-term transmission contract or tariff.

Aside from satisfying the policy directives encompassed within Section 83D, the RFP states that another fundamental purpose of the RFP is to assist the Commonwealth with meeting its goals under the Global Warming Solution Act (“GWSA”), which requires reduction in greenhouse gas emissions in specified percentages by dates certain, including 2020.<sup>13</sup>

83D requires that the Distribution Companies jointly solicit proposals no later than April 1, 2017.<sup>14</sup> Prior to that time, the Distribution Companies and DOER must propose “the timetable and method for

<sup>11</sup> “New Class I renewable portfolio standard eligible resources” are “Class I renewable energy generating facilities as defined in section 11F of chapter 25A of the General Laws that have not commenced operation prior to the date of execution of a long-term contract or that represent the net increase from incremental new generating capacity at an existing facility after the date of execution of a long-term contract.” Section 83B.

<sup>12</sup> Section 83D(d)(4)

<sup>13</sup> RFP Section 1.1.

<sup>14</sup> Section 83D(a).

solicitation of long-term contracts” to the Department, after consulting with the AGO. The Department must approve the issuance of the RFP.

Section 83D contains a number of criteria that are relevant to the design and implementation of the 83D RFP. They include the following criteria applicable to proposals submitted by bidders:

- Contribute to reducing winter electricity price spikes;
- Are cost effective to electric ratepayers in the commonwealth over the term of the contract taking into consideration potential economic and environmental benefits to the ratepayers;
- Avoid electrical line losses and mitigate transmission costs to the extent possible and ensure that transmission cost overruns, if any, are not borne by ratepayers;
- Allow long-term contracts for clean energy generation resources to be paired with energy storage systems;
- Guarantee energy delivery in winter months;
- Adequately demonstrate project viability in a commercially reasonable timeframe.

These and other matters were taken into consideration by the Distribution Companies and DOER in developing and implementing the 83D RFP.

## B. Development of the RFP and its Approval for Issuance

In November 2016, DOER and the Distribution Companies commenced work in earnest on development of the 83D RFP.

Under 83D and 83C, DOER and the AGO are responsible for selecting, and the DOER for contracting with, an independent evaluator to monitor and report on the solicitation process. Following issuance of a Request for Quote by DOER on November 23, 2016 for the provision of Independent Evaluator services, Peregrine and its subcontractors were selected to serve as Independent Evaluator for the 83D solicitation and the first 83C solicitation. Peregrine started work on December 28, 2016.

The IE reviewed draft RFP documents and attended meetings and conference calls with respect to development of the RFP. The IE’s review focused on the elements of the RFP which were relevant to the IE’s scope of review and concerns. The IE provided its feedback to the Distribution Companies and DOER. Some of the IE’s suggestions were incorporated into the RFP, while others were considered but were not incorporated. Of those suggestions not incorporated, the IE was for the most part satisfied with the rationale for maintaining the approach as drafted.

In the Distribution Companies and DOER’s development of the RFP evaluation criteria, not all issues were fully decided but were left for further development and agreement through price and non-price evaluation protocols that were to be developed over the next few months. This was due to two major



factors: (1) timing constraints associated with the statutory requirement that the solicitation be issued on or by April 1, 2017; and (2) the complexity of the solicitation process. The RFP needed to be structured to provide for evaluation of bids with and without transmission, and with types of generation having different characteristics and industry practices.

The Distribution Companies filed the proposed RFP with the Department on February 2, 2017, seeking approval under 83D(b) of the “timetable and method for solicitation of long-term contracts.” Shortly thereafter, Peregrine submitted its IE report, as required by 83D(f), analyzing the draft RFP and including any recommendations for improving the process consistent with the statutory objective of “ensur[ing] an open, fair and transparent solicitation and bid selection process that is not unduly influenced by an affiliated company.” The IE suggested four modifications to the draft RFP:

- RPS Class I resources should not be required to incorporate in their bids the cost of network upgrades that go beyond those required to satisfy the ISO New England (“ISO-NE”) Capacity Capability Interconnection Standard (“CCIS”);
- The Distribution Companies and DOER—the Evaluation Team—should be allowed to modify the requirement that bidders must provide studies based on the current serial ISO-NE interconnection study system in light of the evolving status of a proposal by ISO-NE to convert partially to a cluster study system;
- In the event that the Evaluation Team subsequently determines that RPS Class I RECs will be valued in a way that is comparable to the valuation of the hydroelectric generation environmental attributes that do not qualify under the RPS, the RFP and form PPA provisions allowing the Distribution Companies to not pay for RECs if the RECs no longer qualify under the RPS due to a change in law should be eliminated because there are no similar provisions applicable to hydroelectric generation environmental attributes;
- Transmission bidders should be required to limit the recovery of abandoned plant cost at the FERC, if such recovery is sought, to costs incurred after the issuance of the RFP, and a winning transmission bidder should not have any right to recover abandoned plant costs from the Distribution Companies unless and until contracts have been executed and required regulatory approvals have been obtained, subject to any other negotiated limitations.

Over 20 parties, including the AGO, submitted comments to the Department on the proposed RFP. In response to some of the comments, the Distribution Companies provided clarifying changes to the RFP’s definition of the RPS Class I firmed by hydro bid category (Section 2.2.1.3.ii) and the winter energy guarantee requirement (Section 2.2.2.7).<sup>15</sup>

<sup>15</sup> <https://eeaonline.eea.state.ma.us/EEA/FileService/FileService.Api/file/FileRoom/9188427>. In addition, the Distribution Companies added a requirement for energy pricing to RFP Section 2.2.1.4 to address instances of negative pricing, which had been inadvertently omitted from the 83D RFP. <https://eeaonline.eea.state.ma.us/EEA/FileService/FileService.Api/file/FileRoom/9187992>.

On March 27, 2017, the Department approved for issuance the proposed RFP (as revised) with minimal changes.<sup>16</sup> On March 31, 2017, the Evaluation Team posted the RFP on the website for the RFP process, [www.macleanenergy.com](http://www.macleanenergy.com). Also posted on the RFP website were the form model contracts for (a) RPS Class 1 energy resources, (b) firm hydroelectric generation resources, and (c) RPS Class I energy resources firmed by hydro, as well as a summary of terms to be addressed for proposed transmission service agreements, and forms to be filled out by bidders.<sup>17</sup> Email notification of the posting was sent out to a notification list of approximately 650 industry participants and stakeholders.

### C. Independent Evaluator Scope and Standard of Review

The Energy Diversity Act sets forth the standard of “open, fair and transparent” with regard to the solicitation and bid selection process and one that is “not unduly influenced by an affiliated company.” The Department has applied essentially the same standards in approving for issuance the Clean Energy RFP under Section 83A of the GCA.<sup>18</sup> There, the Department stated that “the RFP may result in the submission of bids from the electric distribution companies’ affiliates or include projects in which the electric distribution companies or their affiliates have a financial interest,” thus, requiring “safeguards. . . to ensure that no potential bidder receives preferential treatment.”<sup>19</sup> Similarly, there was the prospect for the 83D solicitation (as well as for 83C)—which turned out to be realities—that Distribution Company affiliates, or projects in which the Distribution Companies or their affiliates have a financial interest, would be bidders. In enacting 83D (as well as 83C), the Massachusetts Legislature required the retention and use of an Independent Evaluator as a safeguard to help ensure the openness, fairness and transparency of solicitations to be issued and to safeguard against any undue preferences toward EDC affiliates or unjust discrimination against any bidder.

FERC has enunciated what are sometimes referred to as the *Edgar-Allegheny* principles in decisions involving transactions between affiliates in which the buyer is a regulated utility. In the *Edgar* case in 1991, FERC required that a seller of wholesale electric power making a sale to an affiliated regulated utility for resale at market-based rates demonstrate that the rates and other terms and conditions of the power

<sup>16</sup> The Department’s interpretation of its scope of review under 83D—the “timetable and method for soliciting long-term contracts”—is narrow. *Fitchburg Gas and Electric Company et al.*, D.P.U. 17-32 (2018) at 18-19. The Department directed the Distribution Companies to correct inconsistencies regarding the time period that bidders must hold open their bids, which they had already agreed to do, *Id.* at 40, but did not require any other changes to the proposed RFP, including those suggested by the IE. This report addresses, among other things, how the issues raised by the IE in its initial report to the Department were managed in the implementation of the RFP process.

<sup>17</sup> The model PPAs and summary of terms for transmission service agreements had not been previously provided to the Department with the RFP in connection with the Department’s approval of the issuance of the RFP. This was in accordance with past Massachusetts RFP practices.

<sup>18</sup> *Fitchburg Gas and Electric Company et al.*, D.P.U. 15-84 (2015) at 43-45 (“fair, transparent, and competitive” and “fair, open, and transparent”).

<sup>19</sup> *Id.* at 43-44.

sales contract are not unduly preferential to the seller.<sup>20</sup> Where there is a competitive procurement process, FERC has required assurance that:

1. The process was designed and implemented without undue preference for the affiliate seller,
2. The analysis of the bids or responses did not favor the affiliate, particularly with respect to evaluation of non-price factors, and
3. Selection was based on some reasonable combination of price and non-price factors.<sup>21</sup>

In *Allegheny Electric Supply Company, LLC*, 108 FERC ¶ 61,082 (2004), FERC set forth guidelines applicable to its review of competitive solicitation processes under the *Edgar* standards.

1. “Transparency: the competitive solicitation process should be open and fair.
2. Definition: the product or products sought through the competitive solicitation should be precisely defined.
3. Evaluation: evaluation criteria should be standardized and applied equally to all bids and bidders.
4. Oversight: an independent third party should design the solicitation, administer bidding, and evaluate bids prior to the company’s selection.”

Subsequently, FERC found it sufficient for the independent third party to have overseen the design and implementation of the competitive bidding process, rather than to conduct the process itself.<sup>22</sup> The purpose of the FERC guidelines is to provide assurance that regulated electric utilities do not unduly favor their affiliates, to the detriment of their customers.

Peregrine views the 83D (and 83C) standard of “open, fair and transparent” and “not unduly influenced by an affiliated company” to be substantially the same as the *Edgar-Allegheny* principles enunciated by FERC. Hence, the Independent Evaluator has viewed the *Edgar-Allegheny* principles as providing guidance in its review of the design and implementation of the 83D RFP.<sup>23</sup>

<sup>20</sup> Boston Edison Electric Co: Re: Edgar Electric Energy Co., 55 FERC ¶ 61,382 (1991) (“*Edgar*”).

<sup>21</sup> *Edgar*, 55 FERC ¶ 61,382 at 62,128.

<sup>22</sup> *Southern California Edison Company: Re Sycamore Cogeneration Company*, 142 FERC ¶ 61,101 (2013). The role of the Independent Evaluator in competitive bidding processes conducted by electric utilities regulated by the California Public Utilities Commission typically involves an oversight function, rather than the actual conduct of the competitive solicitation.

<sup>23</sup> The FERC guidance also has practical implications for the 83D and 83C solicitation processes. Any PPA resulting from the solicitation process in which the seller is an affiliate of one of the Distribution Company buyers would require FERC approval under *Edgar-Allegheny*. In addition, there is, in our view, a substantial likelihood that FERC would apply the *Edgar-Allegheny* principles to review (a) any transmission service agreement or tariff in which the transmission owner is an affiliate of a Distribution Company resulting from this solicitation and/or (b) any associated PPA, even where the seller under the PPA is unaffiliated with the Distribution Company. See, e.g., *Ameren Electric Generating*

There are other contextual matters that have been important for our review. The requirement for an Independent Evaluator is a matter of Massachusetts law which applies regardless of whether there are affiliate bids or affiliate contracts, and 83D(f) requires the IE to provide “its independent assessment of whether *all* bids were evaluated in a fair and non-discriminatory manner” (emphasis added). Hence, we view the standard of “open, fair and transparent” as being applicable without regard to any specific concerns regarding undue preferences being provided toward affiliates. Also, we note the industry practice where independent evaluators are used, or have been used, to oversee the conduct of competitive solicitations in a variety of states, including California, Nevada, and Delaware.<sup>24</sup> Importantly, we also take into consideration key differences between the 83D/83C process and other solicitations overseen by independent evaluators. Typically, a single electric utility conducts a solicitation, which is overseen by an independent evaluator. Here, multiple distribution companies are conducting the solicitation in coordination with the state energy policy agency, DOER, and the RFP design phase also includes the involvement of the state’s consumer advocacy agency, the AGO. Also, the issuance of the RFP requires Department approval after providing for opportunity to comment by industry stakeholders and prospective bidders. The multiplicity of interests involved in the design and implementation of the solicitation may reduce the potential for one or more Distribution Company affiliates to be recipients of undue preferences, but does not eliminate it. The Independent Evaluator has taken into consideration the composition of the procurement team but has been guided by the *Edgar-Allegheny* principles in the conduct of its responsibilities.

### III. Summary of the Solicitation, Bid Evaluation and Selection Process

#### A. Summary of RFP Provisions

The RFP specifies the products being solicited, also referred to as “Eligible Bid Categories,” identifies the threshold requirements applicable to all proposals, and describes the evaluation criteria and process to be used in evaluating the proposals. In addition, the RFP identifies the timetable for a bidder conference, a question and answer period, submission of bids, bid evaluation and selection, and

*Company*, 108 FERC ¶61,081 (2004) (acquisition of generating facilities from an affiliate under Section 203 of the Federal Power Act) reviewable under the *Edgar* standards); *Southern California Edison Company on behalf of Mountainview Power Company, L.L.C.*, 106 FERC ¶61,183 (2004) (all power purchases from affiliates, whether under market-based rates or cost-based rates, of at least one year in duration will be subject to the *Edgar* standards). In this context, it was prudent to establish and implement a solicitation process that would satisfy the *Edgar-Allegheny* principles.

<sup>24</sup> See Opinion Adopting Pacific Gas and Electric Company’s, Southern California Edison Company’s, and San Diego Gas & Electric Company’s Long-Term Procurement Plans, D.07-12-05 (CPUC 2007) at 131-142, [http://docs.cpuc.ca.gov/PublishedDocs/WORD\\_PDF/FINAL\\_DECISION/76979.PDF](http://docs.cpuc.ca.gov/PublishedDocs/WORD_PDF/FINAL_DECISION/76979.PDF), [https://www.nvenergy.com/company/doingbusiness/rfps/Emissions-Capacity\\_RFP.cfm](https://www.nvenergy.com/company/doingbusiness/rfps/Emissions-Capacity_RFP.cfm) (NV Energy renewable energy RFP); 26 Del C. §1107(d)(2) (requiring retention of an independent consultant for solicitation of long-term contracts), <http://delcode.delaware.gov/title26/c010/>. Other states with formal competitive bidding rules and/or guidelines which require an Independent Monitor or Independent Evaluator, at least for solicitations in which a utility-ownership or affiliate option is present, include, Georgia, Louisiana, Oklahoma, Oregon, Utah, and Hawaii.

contract negotiation and execution, and submittal to the Department of contracts executed as a result of the solicitation. The RFP appendices include a bidder response package, standards of conduct, and form contracts/contract terms against which bidders may submit exceptions.

The RFP sets forth four eligible bid categories, with applicable requirements for each category:

- Proposal to sell Incremental Hydroelectric Generation (including environmental attributes) on a firm \$/MWh basis pursuant to a PPA;

If the proposed Clean Energy Generation specified for delivery in an hour is not delivered, the seller will be responsible for payment of liquidated damages;

- Proposal to sell new Class I RPS eligible resources (energy and RECs or RECs only on a \$/MWh basis) pursuant to a PPA;
- Proposal to sell new Class I RPS eligible resources firmed by Incremental Hydro Generation pursuant to a PPA;

If the proposed Clean Energy Generation specified for firm delivery in an hour is not delivered, the seller will be responsible for payment of liquidated damages;

- Any of the foregoing types of PPA proposals packaged with a proposed transmission project with payments to be made under a FERC tariff and service agreement.<sup>25</sup>

The evaluation of the bids is to be conducted in three stages. In the first stage, the Evaluation Team reviews bids for compliance with various eligibility and threshold requirements (although this review may take place throughout the evaluation period). Among the eligibility/threshold requirements are the following:

- Term length of proposed contract: 15-20 years from commercial operation
- Allowable pricing:
  - a. Seller to take energy price risk associated with negative Locational Marginal Price ("LMP) at the delivery point
  - b. Seller of Class I RECs to take RPS change in law risk; pricing for Clean Energy Generation and Class I RECs must closely align with the relative market value of those products
  - c. For transmission projects, fixed prices are encouraged, but significant cost containment features are required for bids with cost of service pricing

<sup>25</sup> RFP Section 2.2.1.3.



- Bidders are responsible for all costs associated with interconnecting their projects using the Capacity Capability Interconnection Standard, although bidders are not required to clear their proposed projects in ISO-NE's Forward Capacity Market
- Site control:
  - a. Bidders of generation projects must demonstrate site control
  - b. Bidders of transmission projects must demonstrate a reasonable and achievable plan to obtain site control
- Ability to finance the proposed project (financial viability)
- Ability to develop, finance and construct the proposed project in a commercially reasonable timeframe (project viability).

In Stage Two, projects that satisfy the Stage One requirements are evaluated quantitatively and qualitatively. The result of this analysis is a relative ranking and scoring of all individual proposals. Stage Two scoring is on a 100-point scale, with a maximum 75-point score based on the quantitative evaluation and a maximum 25-point score based on the qualitative evaluation.<sup>26</sup>

The RFP describes the direct contract costs and benefits to be evaluated for energy, RECs and transmission as well as other benefits and costs for evaluation, such as the impact of changes to LMPs paid by EDC customers and the impact of the proposal for contributing to meeting the Commonwealth's GWSA requirements, as determined by the Evaluation Team.<sup>27</sup>

The RFP describes a number of factors for inclusion into the qualitative evaluation, such as bidder experience with similar projects, credibility of the project schedule, progress in the interconnection process, status of the project's community relations plan, credibility of the project's energy resource assessment, extent to which the project can support GWSA requirements by delivering energy on or before December 31, 2020, reliability benefits, price firmness and price risk, the extent to which proposed contract terms do not shift risks to the EDCs and their customers, environmental impacts from siting, and economic benefits to the Commonwealth.<sup>28</sup>

The RFP provides that the Evaluation Team will select proposals from Stage Two for consideration in Stage Three taking into consideration rank order and cost effectiveness from the Stage Two evaluation

<sup>26</sup> RFP Section 2.3.

<sup>27</sup> RFP Section 2.3.1.

<sup>28</sup> RFP Section 2.3.2. A change was made to RFP Section 2.3.2 in June 2017 to conform with RFP Section 1.1 ("the Distribution Companies encourage proposals which include Clean Energy Generation able to commit to begin deliveries prior to the end of 2020 to maximize the Commonwealth's ability to meet its Global Warming Solution Act ("GWSA") goals"). See [https://macleanenergy.files.wordpress.com/2016/12/83d-rfp-and-appendices-final\\_june-12-2017-conforming-changes-redlined.pdf](https://macleanenergy.files.wordpress.com/2016/12/83d-rfp-and-appendices-final_june-12-2017-conforming-changes-redlined.pdf).

and the annual procurement target—9,450,000 MWh.<sup>29</sup> In Stage Three, the Evaluation Team is to develop portfolios of projects based on the annual procurement target to determine overall cost effectiveness and impact on the Commonwealth’s policy goals, as directed by DOER, including GWSA goals.<sup>30</sup> In Stage Three, other factors may be considered by the Evaluation Team, such as risks associated with project viability of the proposals, any risks to customers associated with transmission projects and benefits to customers that may not have been fully captured in the Stage Two evaluation.<sup>31</sup>

The timeline in the RFP (subject to modifications as determined by the Evaluation Team) called for a bidder conference, a due date for bidder questions to the Evaluation Team, bids to be submitted by July 27, 2017, bid selection by January 25, 2018, contract execution by March 27, 2018, and submittal of contracts for Department approval by April 25, 2018.<sup>32</sup>

A more detailed summary of RFP terms is provided in Appendix B to this report.

## B. Post-RFP Issuance: Bidder Conference; Answers to Bidder Questions; Development of the Detailed Evaluation Framework

### 1. Bidder Conference

The Evaluation Team held a bidder conference at Eversource’s offices in Westwood, Massachusetts on April 25, 2017, with a presentation provided on the solicitation and bid evaluation process.<sup>33</sup> There were over 90 attendees. Bidder questions were entertained, but prospective bidders were advised that questions needed to be submitted in writing in order for the Evaluation Team to provide an official response.

### 2. Questions and Answers

Bidders submitted over 100 questions in writing. The questions were submitted to a dedicated email account, which was the specified method by which prospective bidders could communicate to the Evaluation Team. The Evaluation Team provided written responses in batches as responses were finalized.<sup>34</sup> All responses were posted on the RFP website by June 30, 2017. The responses were a collaborative effort by the Distribution Companies and DOER, with IE oversight to assure consistency with the RFP, accuracy, and fairness.

<sup>29</sup> *Id.*

<sup>30</sup> RFP Section 2.4.

<sup>31</sup> *Id.*

<sup>32</sup> RFP Section 3.1.

<sup>33</sup> <https://macleanenergy.com/83d/83d-bidder-conference/>.

<sup>34</sup> <https://macleanenergy.com/83d/83d-q-a/>.

### 3. Development of the Detailed Evaluation Framework

#### *a. Introduction*

After issuance of the RFP, a key activity was to develop evaluation protocols for the Stage 2 quantitative evaluation, the Stage 2 qualitative evaluation, and the Stage 3 evaluation. Contemporaneously with the Stage 2 quantitative evaluation protocol, the Evaluation Team worked with the Evaluation Team's consultant, Tabors Caramanis Rudkevich ("TCR"), to develop a base case for evaluation. These were steps required to implement the broad terms of the RFP and to provide guidance to the Evaluation Team for the evaluation of bids on a fair and non-discriminatory basis. The Evaluation Team also developed a checklist of eligibility and threshold requirements to aid in the Stage One evaluation. Finally, the Evaluation Team organized itself into several committees: a Steering Committee to oversee the work of the Evaluation Team, a Quantitative Committee responsible for the development and implementation of the detailed quantitative evaluation, and a Qualitative Committee responsible for development and implementation of the detailed qualitative (non-price) evaluation. Later, committees were also set up to focus on the threshold requirements evaluation and transmission matters.

This section of the report summarizes the development of the detailed framework for the evaluation of bids.

#### *b. Quantitative Evaluation Protocol and Base Case Development*

Work on development of the base case and the detailed quantitative evaluation framework began in earnest in June 2017 after the Distribution Companies retained TCR as the Evaluation Team Consultant, the Evaluation Team had responded to most of the bidder questions, and the draft offshore wind RFP under Section 83C of the Energy Diversity Act had been filed with the Department for approval.<sup>35</sup> TCR proposed utilization of the ENELYTIX model to evaluate the energy, REC and clean energy attribute costs and carbon emissions impacts of proposals submitted by bidders relative to a base case.<sup>36</sup> The base case would be developed by TCR working in conjunction with the Evaluation Team under the oversight of the

<sup>35</sup> Under Section 83C(a), the Distribution Companies were required to jointly issue a RFP for long-term contracts from offshore wind resources on or by June 30, 2017, following Department approval. In order to meet that statutory deadline, most of the 83D Evaluation Team worked on development of the 83C RFP in March and April 2017 so that it could be filed with the Department by the end of April 2017 (it was filed on April 28, 2017). The Distribution Companies retained the Evaluation Team Consultant (under the 83D RFP, the firm retained "to assist the Evaluation Team with the technical methodologies and findings for eligible proposals") in June 2017.

<sup>36</sup> The ENELYTIX model has three module components: (a) a capacity expansion module to determine the long-term optimal electric system expansion in New England, subject to capacity, RPS, and environmental requirements; (b) the energy and ancillary services module which simulates the day-ahead and real-time operations of the power system and power markets on a nodal basis; and (c) an ISO-NE FCM module which is used to compute capacity prices. The objective function is to minimize the total cost of the wholesale generation fleet serving the ISO-NE market. The ENELYTIX model and the modeling approach is described in more detail in a report provided by TCR to the Distribution Companies.

Independent Evaluator. Key assumptions for the base case were developed in parallel with the quantitative evaluation framework which would be embodied in a quantitative evaluation protocol.

The base case is a “but for” case against which all of the 83D bid proposals would be evaluated. The base case assumed that the Distribution Companies would not purchase energy, RECs and environmental attributes under long-term contracts pursuant to 83D. However, under the base case, all other legislative and regulatory mandates then in effect and certain proposed rules were assumed to be satisfied. These included: (a) RPS rules in Massachusetts and the other New England states; (b) compliance with new Massachusetts Clean Energy Standard (“CES”) rules (final rules were issued on August 11, 2017 and amended on December 8, 2017), which set a minimum percentage of clean energy that distribution companies and competitive suppliers must purchase as a percentage of their total sales (in addition to complying with the Massachusetts RPS);<sup>37</sup> as well as (c) new limitations imposed on carbon dioxide emissions from Massachusetts fossil fuel-powered electric generating facilities (also made effective in August 2017).<sup>38</sup> The purpose of these new rules was to facilitate compliance with the GWSA, which requires an 80 percent reduction in greenhouse gas (“GHG”) emissions by 2050, with an administratively-determined goal of 25 percent reductions by 2020. In addition, it was assumed that 1600 MW of offshore wind energy generation would be built pursuant to the 83C mandate to conduct solicitations for 1600 MW of long-term contracts for energy and RECs from offshore wind energy generation facilities.

Development of the base case involved making a variety of key assumptions involving fuel costs, load forecasts, RPS and CES requirements, and imports. The load forecast was based on the ISO New England 2017 CELT (Capacity, Energy, Loads and Transmission) report, with an extrapolated load forecast beyond 2026 (the last year covered in the 2017 CELT report). The assumptions for development of the base case (which were also common to modeling of proposal cases and portfolio cases) are described more fully in TCR’s Quantitative Evaluation Report which has been filed with the Department.

The detailed quantitative evaluation framework, described in the quantitative evaluation protocol, consisted of a benefit/cost analysis using the ENELYTIX modeling tool with two categories of benefits and costs—(1) direct contract costs and benefits and (b) indirect costs and benefits. Importantly, the evaluation framework incorporated the effects of the newly-enacted CES (as amended), which provided that all hydroelectric generating attributes procured and retained under the 83D solicitation and RPS Class I-qualifying resources will be CES-compliant.

Direct costs of a proposed project would include the bidder’s proposed cost of energy, the proposed cost of RECs for RPS Class 1-compliant bids, and for proposals with transmission, the proposed cost of transmission service. Against these costs, the market value of energy at the delivery point would be

<sup>37</sup> <http://www.massdep.org/BAW/air/cesf-amend.pdf>.

<sup>38</sup> <http://www.mass.gov/eea/docs/dep/air/climate/3dregf-electricity.pdf>.

calculated on a nodal basis with the project in service. In addition, the avoided cost of RECs (for RPS-compliant projects), and the avoided cost of Clean Energy Credits (“CECs”) (for CES-compliant projects), would be calculated. Wind, solar, and other projects that are compliant with RPS Class I and the CES would obtain value for the projected value of RECs/CECs. Hydroelectric generation procured under 83D would obtain value for the projected value of CECs.<sup>39</sup>

The indirect benefits (or costs) associated with a proposal included:

- The impact of changes in LMPs (locational marginal prices) to Massachusetts Distribution Company customers as a result of the proposed project (or portfolio of projects);<sup>40</sup>
- The cost reductions to Massachusetts EDC customers in RPS/CES compliance costs due to reductions in REC and/or CEC market prices as a result of purchases of RECs/CECs from the proposed project (or portfolio of projects);
- The value of a proposal’s contribution toward meeting GSWA requirements over and above the value of compliance with the RPS and CES;
  - This value was based on simulating the impact on the GHG inventory that is used by the Massachusetts Department of Environmental Protection (“DEP”) (for assessing the Commonwealth’s GWSA compliance) to calculate the inventory impact of a proposed project in reductions in metric tons of carbon dioxide equivalent emissions attributed to Massachusetts;
  - The quantity of GHG reductions is then multiplied by the base case emissions rate (GHG/MWh) to obtain a MWh equivalent of GHG emissions reductions (subject to further adjustment, as described later in this section);
  - The resulting MWh value is multiplied by the estimated avoided cost per MWh of obtaining incremental clean energy to obtain the total GHG inventory impact;
    - Preliminarily, this avoided cost was estimated to be \$20/MWh, but after the bids were evaluated in Stage 2, the amount was recalculated based on the median net direct cost without REC/CEC revenues (total costs minus energy revenues) per MWh of qualifying bids in the Stage 2 evaluation;
- The “hedge value” associated with the proposal during periods of high natural gas prices;
  - The three winter month period with the highest prices in the last 15 years was applied to a single power year (2023/2024), with the proposed project in place, to assess the relative

<sup>39</sup> 310 CMR 7.75 (2), (6), (7). RECs and CECs that would be used to serve EDC distribution load would be valued at their avoided cost (the base case value), while any surplus RECs and CECs that were sold would be valued at their market price.

<sup>40</sup> The Evaluation Team considered whether to use LMP impacts or a combination of LMP impacts and share of production cost savings as a measure of indirect customer benefits. AT TCR’s recommendation, LMP impacts alone were valued on the basis that they are a more direct measure of customer savings.



response to high natural gas prices, and a 1 in 15 year frequency was applied to calculate an impact on a \$/MWh basis.

- This “hedge” or “insurance value” was a method of implementing the RFP’s inclusion of “the economic impacts associated with resource firmness” (RFP section 2.3.1.2.iv) as a quantitative benefit in the context of 83D(d)(5)(ii)’s criterion that clean energy resources “contribute to reducing winter electricity price spikes.”<sup>41</sup>

The economic metric by which bids were to be evaluated was real levelized \$/MWh (2017\$). This metric had been recommended by TCR and DOER’s consultant Levitan and Associates (“LAI”).<sup>42</sup> Other financial parameters were nominal inflation—2 percent, a nominal discount rate of 6.99 percent, and a real discount rate of 4.89 percent.

Under the RFP, the maximum number of points for the most cost-effective bid quantitatively in real \$/MWh was 75, with a maximum of 25 points for the qualitative evaluation. Bids other than the highest ranking bid in the quantitative evaluation would receive a number of points based on the ratio of the bid’s \$/MWh net benefit to that of the highest ranking bid multiplied by 75. For example, if the highest ranking bid in the quantitative evaluation was \$25/MWh and the second ranking bid was \$20/MWh, the highest ranking bid would receive 75 points and the second ranked bid would receive 60 points ( $20/25 \times 75$ ), subject to an outlier exception.

The Evaluation Team spent considerable time with TCR in the development of key assumptions for the economic analysis. If RPS supply was forecasted to be short of RPS demand, it was assumed that generic merchant RPS eligible generation would fill the gap using the ENELYTIX capacity expansion model. However, with respect to the CES, the model did not “solve for” the addition of CES-compliant generation. Instead, CES-compliance would be satisfied by either economic generation or by Alternative Compliance Payments (“ACP”), which beginning in 2021 would be 50 percent of the ACP under the Massachusetts RPS (in 2017, the ACP for RPS Class 1 is \$67.70; 50 percent of that is \$33.85).<sup>43</sup> This approach took into consideration the uncertainty as to whether the market alone would produce clean energy generation projects in the absence of long-term contracts (based on historical experience in New England). If there was a surplus of RECs or CECs, a \$2 market price was assumed, based on an amount to cover transaction costs.

<sup>41</sup> Other indirect benefits were considered but were not ultimately incorporated in the final evaluations. The Evaluation Team considered the indirect impacts on capacity or ancillary service market prices with the proposed project in service (see RFP Section 2.3.1.2.v). However, there was insufficient data to determine the impact of proposed projects on ancillary services market prices (sometimes referred to as renewable integration costs) and the indirect impacts on market capacity prices were initially considered but were discarded when the results were deemed unreliable by the Evaluation Team. The IE concurred with these determinations. These considerations, however, were incorporated in the qualitative evaluation’s reliability criterion.

<sup>42</sup> Also advising DOER was nFront Consulting, a subcontractor to LAI.

<sup>43</sup> In 2018-2020, the CES ACP is 75 percent of the RPS ACP during those years.

Bids were submitted on the due date of July 27, 2017. At that time, the Evaluation Team had not finalized the evaluation protocols, particularly the quantitative evaluation protocol. Prior to receipt of the bids, the Evaluation Team decided, with the IE's concurrence, that a specific person or persons for each Distribution Company would review information associated with the bids and wire transfer information to assess the adequacy of the bid fees. These persons would not communicate with other Distribution Company personnel involved in finalizing the evaluation protocols and the base case. With this limited exception, Distribution Company personnel would not review or have access to the bids pending the Evaluation Team's determination that the evaluation protocols and base case were effectively completed. Similarly, DOER and IE personnel working on finalization of the evaluation protocols and base case would not review the bids until the Evaluation Team determined that the evaluation protocols and base case were effectively completed. The purpose of this arrangement was to minimize the potential for review of the bids to influence decisions on the evaluation protocols, especially since there were expected to be bidders who would be affiliated with one or more of the Distribution Companies. On August 2, 2017, the Evaluation Team determined that the evaluation protocols were effectively complete, subject to further adjustments deemed necessary by the Evaluation Team, and evaluation of the confidential bids commenced. Over the next weeks and months, the base case and the quantitative evaluation protocol were further refined.

It was determined that for small projects that only direct benefits would be included in the Stage 2 quantitative evaluation, and that small projects would be compared and ranked against other small projects. The primary reason for this was that the Evaluation Team determined, based on initial modeling results, that the indirect benefit results from the ENELYTIX modeling appeared to be due to modeling "noise" rather than realistic impacts from projects. The IE did not see this approach as being inappropriate or discriminatory. Higher ranked smaller projects could be selected for inclusion in portfolios of approximately 9.45 TWh for Stage 3 evaluations, where the smaller projects in conjunction with other projects would be evaluated on the same basis as the larger projects, with both direct and indirect benefits evaluated.<sup>44</sup>

The Evaluation Team operated by consensus. For the most part, the Evaluation Team members worked effectively together, although it took more time to make decisions than if the evaluation was being conducted by a single entity. The one area where the Evaluation Team was unable to reach consensus in developing the detailed evaluation framework was with respect to one important aspect of the methodology to determine contributions to meeting GWSA requirements.

DOER, supported by Eversource and Unitil, viewed the GWSA contribution value as being incremental to the market value for RECs and CECs that would be retired by the EDCs or Massachusetts competitive retail suppliers but not as separate additional values. As a result, in determining the *net* GWSA

<sup>44</sup> TCR defined projects as "small" if their generation capacity contribution for qualification in the Forward Capacity Market was less than or equal to 140 MW or its annual generation of RECs or CECs was less than 670 GWh/year. These thresholds were selected because they were not expected to reduce or delay the need for generic peaking capacity or to have an impact on REC/CEC market prices.

contribution in MWh, the DOER proposed methodology subtracted the amount of RECs and CECs (1 REC or CEC is equal to 1 MWh) forecasted to be retired in Massachusetts from the MWh-equivalent amount of carbon dioxide emissions attributable to a proposal compared to the base case. DOER viewed this approach as avoiding “double counting” of clean energy generation attributes.

The impact could be different for environmental attributes associated with hydroelectric generation (“Environmental Attributes” or “EAs”)—which could qualify as CECs but not RECs—compared to RPS Class 1 resources due to a provision of the 83D legislation, which requires that the EDCs retain the Environmental Attributes.<sup>45</sup>

National Grid objected to this *net* approach, asserting that the RPS and CES created a market for environmental attributes and a marketable REC and CEC product that is different from and in addition to the value of reducing GHG emissions in a way that contributes to Massachusetts meeting its GWSA goals. National Grid proposed to calculate GWSA contributions in the same way as proposed by DOER but without deducting the MWhs associated with meeting RPS or CES requirements. After numerous discussions, National Grid stated that it would not accede to the other members of the Evaluation Team with respect to this aspect of the evaluation framework. The company proposed that it would evaluate proposals based on its proposed method, and if it resulted in the company making a different bid selection decision than the other EDCs, DOER could make the final decision after consulting with the IE, as provided by 83D.

The IE expressed the view that in the event of a failure to reach agreement on an important issue, the dispute resolution approach set forth in the statute could be applied to issues other than bid selection. However, National Grid expressed disagreement, and there was no consensus reached on a process to

<sup>45</sup> Section 83D(f) provides:

An electric distribution company may elect to use any energy purchased under such [83D] contracts for resale to its customers, and may elect to retain renewable energy certificates to meet the applicable annual renewable portfolio standard requirements under said section 11F of said chapter 25A. If the energy and renewable energy certificates are not so used, such companies shall sell such purchased energy into the wholesale market and shall sell such purchased renewable energy certificates attributed to Class I renewable portfolio standard eligible resources to minimize the costs to ratepayers under the contract; provided, further, that a *distribution company shall retain renewable energy certificates that are not attributed to Class I renewable portfolio standard eligible resources* (emphasis added).

With regard to Environmental Attributes, the MWhs used to meet the Distribution Companies’ CES obligations would be valued as CECs and would be deducted from the MWh-equivalent GHG contribution of a proposal, but the amount in excess would not be valued as CECs and would not be deducted in the GWSA contribution calculation because the Environmental Attributes would be retained by the Distribution Company. With regard to RPS Class I resources, similarly the RECs and CECs used to meet Massachusetts RPS and CES obligations would be deducted from the GWSA contribution calculation to avoid double counting of the value of the environmental attributes. However, where the market is in surplus, the RECs would be sold to comply with the 83D legislative mandate to sell them into the wholesale market. It was assumed that a share of them (based on defined criteria) would be retained in Massachusetts for voluntary sales, and this amount would be included in the GWSA contribution calculation—the remainder would not contribute to meeting GWSA requirements in the Massachusetts inventory. To be clear, the MWhs deducted in the GWSA contribution calculation because they would be valued as RECs or CECs, as applicable, would be valued as direct benefits of a project proposal.

reach a decision. National Grid requested that TCR perform a calculation of net benefits using its proposed approach in addition to the calculations performed for the majority of the Evaluation Team. Under these circumstances, the IE opined that the workbooks using the DOER approach should be viewed as the “official workbooks” and that the calculations performed for National Grid be in separate workbooks to avoid confusion. Without taking a position on the substance of the issue in dispute, the IE explained that the DOER method should be viewed as the “official” evaluation because it was supported by the majority of the Evaluation Team and that the issue involved energy policy matters and an interpretation of agency regulations and programs, which entitled DOER to some deference on the particular matter. National Grid expressed the hope that its different way of calculating net economic benefits would not result in differences in bid selection.<sup>46</sup> As it turned out, the different approaches did not result in significant differences in the bid evaluation results. The evaluation process proceeded.

*c. Qualitative Evaluation Protocol*

Under the RFP, a total of 25 maximum points was allocated to the qualitative evaluation component of Stage 2 of the evaluation process. In May 2017, a subgroup of the Evaluation Team began to develop the detailed evaluation framework for the qualitative evaluation, which would be embodied in a qualitative bid evaluation protocol.

The starting points were the 83D RFP and a prior qualitative evaluation protocol used in the multi-state RFP, which was conducted (from a Massachusetts standpoint) under Section 83A of the Green Communities Act. The objective was to modify the protocol previously used for applicability to the 83D RFP.

The qualitative criteria listed in Section 2.3.2 were extensive, including the general categories of overall project viability, operational viability, contributions to GWSA goals by the end of 2020, siting and permitting, reliability benefits, price firmness, contract risk, environmental impacts from siting, and economic benefits to the Commonwealth. The first step in the process was to ensure the qualitative criteria listed in the RFP were appropriately addressed in the bid evaluation. As part of this process, the Evaluation Team reviewed whether some of the criteria would be effectively addressed in the quantitative evaluation or whether certain outputs from the quantitative evaluation could be used and incorporated into the qualitative evaluation.<sup>47</sup> Otherwise, evaluation criteria would be addressed qualitatively as part of the qualitative bid evaluation.

<sup>46</sup> With the single exception that MWhs associated with meeting RPS and CES requirements were not deducted in the GWSA calculation, TCR performed the GWSA indirect benefit calculation for National Grid in an identical manner as for the calculations for the remainder of the Evaluation Team. National Grid also expressed reservations with the manner in which the avoided cost of clean energy in \$/MWh was calculated by the Evaluation Team.

<sup>47</sup> For example: curtailment risk (RFP section 2.3.2.ii) was considered to be adequately addressed in the quantitative evaluation and was not incorporated into the qualitative evaluation protocol; the extent to which a project could contribute to GWSA goals by delivering energy by

Once the qualitative evaluation criteria were agreed and draft evaluation sheets were prepared for each criterion, the next step was to include a description of the requirements for proposals to be classified in each of the scoring categories (or rankings) for each evaluation criterion. For most of the criteria, each proposal would be classified into one of three scoring categories based on meeting specified standards: Superior, Preferable, or Meets Minimum Standards. Once the drafts for each criterion were prepared, members of the Qualitative Evaluation Team and the IE reviewed the write-ups. The IE suggested modifications with the objective of providing more clear resolution between different scoring categories to facilitate the evaluation and scoring of bidder proposals.

Other issues addressed included: (1) the total number of points to allocate to each criterion based on the maximum 25 qualitative points; and (2) the amount of points to allocate based on the scoring category for each criterion. For the most part, if a proposal is deemed to meet the requirements listed for the Meets Minimum Standards category, the Bidder would receive 0 points. Proposals rated as Superior would achieve the maximum score for that criterion. Proposals deemed to be in the Preferable category were generally awarded points in the middle of the range, as specified in the qualitative evaluation protocol.

The Qualitative Evaluation Protocol was completed prior to the initiation of proposal review and evaluation.

*d. Stage 3 Evaluation Protocol*

The Evaluation Team developed a Stage 3 evaluation protocol that extrapolated from the RFP provisions applicable to Stage 3 of the evaluation (RFP sections 2.3.2 and 2.4). First, portfolios totaling approximately the annual procurement target of 9.45 TWh would be developed based on the higher-ranked bids from the Stage 2 evaluation. These portfolios would then be subject to the same quantitative evaluation as the large projects in Stage 2. The Evaluation Team would then make decisions regarding the selection of the project portfolio with an annual MWh amount that approximated the annual procurement target. The criteria for selecting project portfolios were described:

- Stage 2 evaluation criteria; other criteria might also be considered, such as production cost savings;
- Cost-effectiveness of the portfolios and impact on the Commonwealth's policy goals, including GWSA goals;
- Risks associated with project viability of the proposals;

the end of 2020 or could provide reliability benefits (RFP sections 2.3.2.iii and 2.3.2.v) was part of the qualitative evaluation protocol, but the scoring for it largely depended on outputs from the quantitative evaluation.



- Any risks that may be associated with proposed transmission agreements not fully captured in the Stage 2 evaluation;
- Any benefits to customers not fully captured in the Stage 2 evaluation;
- Any other factors to ensure that a proposal provides the greatest impact and value consistent with the stated objectives and requirements of 83D.

Finally, the Evaluation Team approved a scope of work for TCR's subcontractor Mott & McDonald, which would review the transmission proposals associated with generation bids in terms of reasonableness of cost estimates and schedule.

### C. Evaluation of the Bids

This section of the report addresses the Evaluation Team's evaluation of proposals at each of the three stages of the evaluation process.

#### 1. Threshold Evaluation

A working group was formed to review the various project proposals for threshold and eligibility requirement issues. One bid was disqualified at the outset because it was received by the Evaluation Team a day late.<sup>48</sup>

The threshold working group conducted a preliminary analysis of bids that either appeared not to meet eligibility or threshold requirements or where clarification was required from the bidder. There were also questions where it was not clear whether there was a failure to meet threshold requirements or where more information was needed simply to facilitate the qualitative or quantitative evaluation of the proposal. This led to the Evaluation Team sending letters seeking clarification or additional information from many of the bidders. This was consistent with the RFP provisions which allowed the Evaluation Team to permit bidders to cure deficiencies in their bids.

During any stage of the procurement process, if the Evaluation Team determines that any proposal is deficient and missing applicable information needed to continue the evaluation process, the Evaluation Team will notify the respective bidder and permit the bidder a reasonable opportunity to cure the deficiency and/or supply the missing information.<sup>49</sup>

The letters to bidders covered a wide range of questions, such as whether the bidder had submitted interconnection studies that satisfied RFP requirements (RFP section 2.2.1.9), complied with RFP pricing requirements (Section 2.2.1.4), and demonstrated sufficient site control (Section 2.2.2.1). In addition, letters were sent to bidders of generation with associated transmission regarding the specific threshold

<sup>48</sup> The bidder was [REDACTED]. The bid fees were returned because no evaluation of the bid was conducted.

<sup>49</sup> RFP section 2.1.

requirements applicable to transmission proposals (RFP Sections 2.2.1.4.i and 2.2.2.6) and the more general requirements applicable to all bids.

The Evaluation Team reviewed bidder responses to the questions. In some cases, the responses were unclear, and follow-up questions were issued to which the bidders responded. Many of the Evaluation Team questions pertained to the RFP requirements applicable to interconnection studies:

All projects submitted by bidders must have filed an interconnection request with ISO-NE. Projects that have received their I.3.9 approval from ISO-NE must identify that approval and include such documentation in their proposal. Proposals that do not have I.3.9 approval from ISO-NE must include technical reports or system impact studies that approximate the ISO-NE interconnection process, including but not limited to clear documentation of study technical and cost assumptions, reasoning, and justification of such assumptions. All studies must assume the project will interconnect using the Capacity Capability Interconnection Standard, must use the current ISO-NE interconnection process (including network impact scenarios from multiple projects interconnecting), and must also detail any assumptions with respect to projects that are ahead of the proposed project in the ISO-NE interconnection queue and any assumptions as to changes to the transmission system that differ from the current ISO-NE Regional System Plan.<sup>50</sup>

All bids were also required to include a commitment to interconnect to the ISO-NE transmission system at the Capacity Capability Interconnection Standard.

The Evaluation Team consulted with ISO-NE representatives regarding the status of projects in the interconnection queue, ISO studies, and applicable ISO rules and practices.

All in all, 17 of the 53 project proposals submitted were determined not to satisfy eligibility and threshold requirements. The great majority of them—13 in all—were determined not to satisfy the interconnection and delivery requirements set forth in Section 2.2.1.9 of the RFP (and/or the commitment to interconnect at CCIS under Section 2.2.1.8). The reasons varied by project, such as not filing an interconnection request with the ISO at the time of bid, withdrawing interconnection requests, not including all costs to deliver to the delivery point, no ISO CCIS study or finding and no bidder CCIS study supplied, studies provided or being conducted that did not meet ISO standards, and location-specific problems that do not allow the CCIS to be satisfied without extensive upgrades that were not proposed by the bidder. Some bids had multiple interconnection-related deficiencies.

One bid from existing hydroelectric facilities in ISO-NE without any proposed expansion was determined not to supply incremental hydroelectricity, as required by RFP section 2.2.1.3.i. Another bidder failed to provide required financial information and failed to demonstrate financial viability of the project (see RFP sections 2.2.1.10 and 2.2.2.2). Finally, there was a failure to demonstrate site control with respect

<sup>50</sup> RFP section 2.2.1.9.

to two project proposals. The proposals that were found not to meet eligibility/threshold requirements, and the basis for determining that requirements were not satisfied, are summarized in Appendix C.

There were several other projects that had substantial questions as to whether they satisfied threshold requirements. However, the Evaluation Team did not reach consensus on these matters, so these projects were evaluated quantitative and qualitatively in the Stage 2 evaluation. None of these projects, however, were highly competitive, and none were selected.

Finally, the IE, pursuant to its contract with DOER, retained a forensic accounting firm, Meaden & Moore, to ascertain whether any bidder failed to disclose any affiliate relationships with the Distribution Companies, as required under RFP section 2.2.1.5. Meaden & Moore identified participation by EDC affiliates in three sets of project proposals—Northern Pass, an Eversource affiliate, involving Quebec hydro-only and hydro and wind bids and proposed transmission in New Hampshire; Granite State Power Link, a National Grid affiliate, involving Quebec wind-only bids and proposed transmission in New Hampshire; and NRPP Bid A, involving a National Grid affiliate, with wind and solar energy and firming hydro from New York. In each case, the Distribution Company affiliate was proposing to build new transmission. After review, Meaden & Moore did not find any bidder that failed to disclose an affiliate relationship to any of the Distribution Companies.

## 2. Stage 2 Quantitative and Qualitative Evaluation

### *a. Quantitative Evaluation*

The Evaluation Team first commenced the quantitative and qualitative evaluation of small projects—defined (for this purpose) as below 300 MW in installed capacity—that passed an initial threshold evaluation screening. These projects were generally easier to evaluate than the larger projects—most of which involved associated new transmission in the project proposals. As more small projects were determined to have passed the threshold evaluation screening, they were passed on to TCR for quantitative evaluation and to the Qualitative Evaluation Team for qualitative evaluation.

The larger projects with associated transmission raised a number of issues for the evaluation. Some of these issues flowed from the lack of a pro forma transmission service agreement (“TSA”) that was provided to bidders (in contrast, PPA bidders were required to bid to a pro forma PPA) and the less restrictive threshold requirements applicable to transmission pricing compared to those applicable to PPAs.<sup>51</sup> These issues included:

- Some proposed TSAs did not include provisions that precluded EDC liability for payments (either for transmission service or abandonment costs) absent non-appealable Department and FERC

<sup>51</sup> The stated reason the Distribution Companies did not include a pro forma TSA in the RFP package was due to a desire to provide bidders with more flexibility. Other likely reasons are the relative lack of EDC experience in this area in a competitive bidding context and, perhaps, the difficulty they would have had on reaching agreement on a pro forma TSA within the timeframe of the RFP process.

approvals (the pro forma PPA precluded EDC liability for charges unless and until a non-appealable Department order approving the PPA was obtained);

- Some proposals contained proposed project schedules and/or pricing that were based on unrealistic assumptions regarding the timing of project selection in this solicitation, contract execution, and Department approvals (including dates that were more accelerated than those set forth in the RFP);
- Some transmission proposals contained either cost-of-service or price adjustment provisions that required estimation of items such as future levels of interest rates, commodity prices, and/or exchange rates;
- There were many clarification questions regarding complex provisions of proposed TSAs and their impact on risk allocation between the transmission owner and the EDCs;
- There were questions regarding whether some TSAs satisfied threshold requirements applicable to TSAs (such as the provisions in section 2.2.2.6 of the RFP regarding cost containment, abandonment cost, and transmission costs in the absence of energy).

The Evaluation Team sent several series of questions to the bidders with associated transmission proposals to address a variety of issues. Typically, the questions involved requests to modify the proposed TSA to conform with threshold requirements or to provide important clarifications.<sup>52</sup> Bidders were also required to provide justification, where applicable, for their estimated costs associated with proposed cost-of-service provisions or those that contained price adjustments based on future costs. This process generally led to improvements in bids from the standpoint of conformance with threshold requirements, risk allocation and clarity. However, it took a substantial amount of Evaluation Team time and attention. The IE was highly involved in this process to assure that the evaluation was fairly and reasonably conducted, especially since three transmission bidders were EDC affiliates. The IE focused in particular on correctly interpreting the transmission proposals and assuring that they would be properly evaluated in the quantitative and qualitative evaluation from an EDC/EDC customer cost and cost risk perspective. Requiring transmission bidders to agree not to charge the EDCs, including for abandoned plant cost recovery, absent non-appealable FERC and Department orders approving the TSA addressed a concern raised by the IE in its RFP design report. In terms of the quantitative evaluation, the IE raised concerns regarding whether some of the costs for some transmission bids were being properly evaluated.

Northern Pass, an Eversource affiliate, had proposed [REDACTED] transmission rates [REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED] NPT's estimated cost of debt was stated as [REDACTED]

<sup>52</sup> As one example, transmission bidders were asked to modify proposed TSAs, where necessary, to clarify that EDCs would not be liable for any charges or for abandonment cost recovery absent non-appealable Department and FERC approvals of the pertinent agreements.

percent [REDACTED] which appeared quite low. The IE drafted a question regarding the basis for this forecasted interest rate. NPT's response stated:

[REDACTED]  
[REDACTED]  
[REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]  
[REDACTED]

[REDACTED]  
[REDACTED]  
[REDACTED]

[REDACTED] At the time the bid was being evaluated (December 2017/January 2018), long-term interest rates had risen significantly from the time of bid submittal and were forecast to increase substantially over the next [REDACTED] years [REDACTED]

[REDACTED]. The IE raised the question to the Evaluation Team as to whether NPT's estimated cost of long-term debt of [REDACTED] was reasonable for use in the quantitative evaluation.

On a conference call in January 2018, TCR, members of the Evaluation and the IE met to discuss what interest rate to use in the quantitative evaluation of the NPT proposals (hydro and hydro and wind). Shortly before the call, National Grid had proposed a 5.00 percent interest rate, based on use of a 20-year Treasury rate representing the term of the proposed contract, a forecasted interest rate of 3.85 percent using the Blue Chip Financial Forecast, Long-range consensus estimate, published on December 1, 2017, and a credit adder of 1.15% based on a review of certain Eversource debt offerings. After discussion, TCR proposed to use a 4.55% for the Stage 2 (as well as Stage 3) evaluations based on use of a 10-year Treasury (reflecting a 20-year term and a 10-year weighted average life given that Treasury bonds pay out principal only at the end of the term), a forecasted interest rate of 3.60 percent based on the same consensus Blue Chip Financial Forecast referenced by National Grid, and a credit adder of .95 percent [REDACTED]—this was later reduced to 4.45% based on a reduced credit

<sup>53</sup> NPT Confidential Bid pp. 5-6 – 5-7.



adder due to a credit rating increase.<sup>54</sup> TCR, the Evaluation Team Consultant, National Grid, and the IE supported use of the 4.45% interest rate for use in the Stage 2 and Stage 3 evaluations.<sup>55</sup>

At this time, Eversource opposed revising the quantitative evaluation—which was based on the [REDACTED] percent interest rate—to incorporate the higher interest rate proposed by TCR. Eversource argued that the bidder’s estimated interest rate should be used in the evaluation because using another interest rate would be “changing the bid.” At a Steering Committee meeting, the IE (and National Grid) thought that the decision was made to use the 4.45% interest rate, but there was apparently a lack of clarity. Subsequently, DOER stated that the higher interest rate should be run as a sensitivity in Stage 3 and not modify the Stage 2 results, which is the way the results were reported. Ultimately, as will be discussed, the selection decision was based on the quantitative evaluation using the 4.45% interest rate assumption.

The IE also raised a concern regarding a second transmission bid. One transmission bidder had proposed fixed transmission rates but had indicated by way of footnote that it was interested in discussing a [REDACTED] price adjustment provision in its TSA if it was selected for negotiations. The Evaluation Team asked the bidder to confirm that the proposed price was a fixed price or to specify any associated price adjustment provisions. The bidder responded that it was seeking a price adjustment for changes in specified [REDACTED] but that it was also proposing an alternative fixed-charge rate, albeit at a higher level than originally bid. The Evaluation Team decided to evaluate both proposals. The IE assisted in formulating questions that would obtain information from the bidder with enough specificity to facilitate TCR’s review of the pricing alternative with the proposed [REDACTED] price provision.

On December 22, 2017, the same day that President Trump signed into law the Tax Cuts and Jobs Act, which, among other things, reduced the corporate income tax rate from 35% to 21%, the Evaluation Team decided to give bidders the opportunity to refresh pricing based on the new lower tax rates, with the expectation that this could lead to significantly lower prices for some bids. In letters to all bidders, bidders were given until January 3, 2018 to propose lower prices if they chose to do so. A number of bidders, including several of the transmission bidders, submitted reduced prices.<sup>56</sup> Since the Stage 2 evaluation was then in the process of being finalized and the impact of the proposed price reductions appeared to be relatively modest, the quantitative evaluation of the revised bids was not included in the final Stage 2 evaluations but was included in the Stage 3 evaluations.

<sup>54</sup> [REDACTED]  
[REDACTED].

<sup>55</sup> This same issue also affected the evaluation of the [REDACTED] bid, which had a price adjustment provision based on the 10-year Treasury note rate prevailing at the time [REDACTED].

<sup>56</sup> The effect on solar and wind projects of the new tax law was not clear because of the potential impact of the legislation on the financing value of investment tax credits and production tax credits. Many wind and solar developers did not provide reduced pricing.

*b. Qualitative Evaluation*

After the initial threshold evaluation review, members of the Qualitative Evaluation team as well as the IE reviewed and scored the proposals. Weekly meetings of the team were held to walk through and discuss the basis for scoring each proposal within each evaluation criterion. During the conference calls to discuss specific proposal scoring, members of the Qualitative Evaluation Team would each identify their score and the basis for the score awarded. If other team members scored the proposal differently, the members of the team would discuss the basis for scoring and attempt to reach a consensus. The IE raised issues if the scoring seemed inconsistent or skewed. In most cases, the IE identified his score and the basis for scoring if relevant to the discussion. The result of the qualitative evaluation was that team members generally reached resolution on a score for each of the criterion for each proposal, and the IE having evaluated and scored each proposal, was satisfied that the results were fair and objective.

There were a number of exceptions, particularly toward the end of the Stage 2 evaluation process, where the evaluation focused on the [REDACTED] categories. For example, Eversource proposed that NPT get a maximum score for the [REDACTED] category and proposed that certain competing transmission bids receive lower scores despite the fact [REDACTED]

[REDACTED] The other members of the Evaluation Team and the IE rejected this position, and the final scores, in the IE's opinion properly reflected the [REDACTED] inherent in these proposals.

Similarly, Eversource proposed that NPT receive the superior score for [REDACTED] while competing bids receive the preferable (i.e., middle) score. Other members of the Evaluation Team and the IE did not accept this position, and NPT was given a preferable (i.e., middle) score.

Also, Eversource had argued that NPT [REDACTED] and, hence, deserved a superior score for [REDACTED], while other members of the Evaluation Team and the IE evaluated NPT as having [REDACTED], deserving only a preferable (i.e., middle) score. After discussion, the Evaluation Team gave NPT a preferable (middle) score in this category; a competing project that had already obtained its [REDACTED] was given a superior score.

[REDACTED]

On these matters, the IE advocated against compromising with Eversource where the result could not be justified on the merits. In the end, the IE was satisfied that the qualitative evaluation of the NPT bids as well as other bids was fair and objective and not unduly influenced by affiliate relationships.

*c. Stage 2 Scores and Ranking*

Summary results for large projects and small projects in terms of the quantitative evaluation, the qualitative evaluation, and total scores for Stage 2 are set forth in Appendix D and Appendix E respectively. These were compiled by TCR in early January 2018 and are reflected in Appendix 1 of the TCR Report. As indicated previously, these scores did not incorporate any proposed price reductions associated with the new corporate tax law and reflected NPT's estimate of [REDACTED] % for the long-term cost of debt for this proposal.

**3. Stage 3 Evaluation of Proposal Portfolios**

At the beginning of Stage 3 of the evaluation, the Evaluation Team developed a number of project portfolios that approximated the annual procurement target of 9,450,000 MWh based on the rank order of projects at the end of the Stage 2 evaluation. In addition, the Evaluation Team developed a number of sensitivity analyses for TCR to model.

A number of proposals were of sufficient size to be their own project portfolios:

|                                  |                      |                |
|----------------------------------|----------------------|----------------|
| - NECEC Hydro (HRE hydro supply) | Portfolio 6          | 9.55 TWh       |
| - [REDACTED]                     | Portfolio [REDACTED] | [REDACTED] TWh |
| - [REDACTED]                     | Portfolio [REDACTED] | [REDACTED] TWh |
| - [REDACTED]                     | Portfolio [REDACTED] | [REDACTED] TWh |
| - [REDACTED]                     | Portfolio [REDACTED] | [REDACTED] TWh |

Other portfolios involved combinations of large and small project proposals:

|            |                      |                |
|------------|----------------------|----------------|
| [REDACTED] | Portfolio [REDACTED] | [REDACTED] TWh |
| [REDACTED] | Portfolio [REDACTED] | [REDACTED] TWh |
| [REDACTED] | Portfolio [REDACTED] | [REDACTED] TWh |
| [REDACTED] | Portfolio [REDACTED] | [REDACTED] TWh |
| [REDACTED] | Portfolio [REDACTED] | [REDACTED] TWh |



TCR ran each of these portfolios in its ENELYTIX model and workbooks using the updated bids. The same quantitative evaluation methodologies were used as in Stage 2, although the revised bids with lower prices based on the tax law changes were evaluated. A quantitative scoring was assigned based on 75 for the portfolio with the highest levelized total net benefits per MWh and a proportionately lower score for other portfolios based on their evaluated net benefits. Qualitative scores were derived by weight averaging the qualitative scores for each project proposal comprising the portfolio.

The highest ranking proposals were NECEC Hydro (Portfolio 6), combinations of NECEC Hydro and [REDACTED], and NPT Hydro. The Evaluation Team decided to run scenarios for NPT Hydro and NECEC Hydro involving one-year delays in COD for these projects and considered different interest rate assumptions for NPT (with a range from the bidder estimate of [REDACTED] % to the TCR recommended rate of 4.45%). Because the top-ranked projects in the portfolio evaluation involved NPT Hydro and NECEC Hydro, the Stage 3 evaluation focused on the respective strengths and weakness of these two project proposals. Since both of them involved similar supplies of hydropower from Hydro Quebec's affiliate, HRE, the evaluation focused on the different transmission proposals and their potential benefits, risks and costs, especially those that may not have been fully incorporated into the quantitative and qualitative evaluation. The next highest ranked project was [REDACTED]

[REDACTED]. The proposed project, while more expensive than either NECEC or NPT, [REDACTED]. The Stage 3 evaluation, as conducted and compiled by TCR, with project rankings based on the real levelized \$/MWh metric and with the ranking for the NPT project based on the assumed 4.45% interest rate, is set forth in Appendix F to this report (which also includes the results of sensitivity runs). During the Stage 3 deliberations, TCR also presented a ranking with NPT's bidder supplied interest rate assumption. Under either set of assumptions, the NECEC Hydro proposal had a higher rank than the NPT Hydro proposal.

DOER put together a table based on the TCR evaluation results, but with alternative scores and ranking using net present value results in addition to scoring and ranking using the real levelized \$/MWh metric. [REDACTED] A summary of that table with scoring based only on the \$/NPV metric is set forth in Appendix G to this report.<sup>58</sup> Using the alternative net present

<sup>58</sup> The scoring for portfolios in Stage 3 based on the real levelized \$/MWh metric is in Appendix F.

value metric, the NPT proposal had higher scores and a higher ranking (taking into consideration the qualitative evaluation) than the NECEC proposal.<sup>59</sup>

During the Stage 3 deliberations, Eversource proposed that the Evaluation Team give preference to projects that deliver earlier than others, stating that the quantitative and qualitative evaluation did not give sufficient value to this attribute and that early delivery can protect against the risks of an early onset polar vortex-type winter. Eversource also proposed that projects whose price may be too low to be financed or were at a relatively early stage of development should be assessed a contingency cost representing a replacement cost if the project can't be built. The IE thought that the Eversource proposal was insufficiently balanced and expressed the opinion that the proposed contingency adder was not supportable or even workable in the context of the solicitation.

The IE provided guidance to the Evaluation Team regarding the appropriate scope of the Stage 3 evaluation and the basis for selection of project proposals.

- The starting point for the Stage 3 evaluation should be the results of the Stage 2 evaluation and the portfolio evaluation results produced by TCR in Stage 3
- In the IE's opinion, the quantitative evaluation and scoring for the NPT Hydro proposal should be based on the 4.45% interest rate recommended by TCR, the Evaluation Team Consultant
- The RFP allows in Stage 3 for the EDCs and DOER to use "a reasonable degree of considered judgment" based on the criteria set forth in the RFP
- Matters for consideration include:
  - Cost-effectiveness of proposals
  - Impact on the Commonwealth's policy goals, including GWSA goals
  - Risks associated with the viability of projects
  - Any benefits that are valid in the context of this RFP but not fully captured in the evaluation
  - Risks associated with transmission costs not fully captured in the evaluation.<sup>60</sup>

■ [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

<sup>60</sup> The IE also noted that the quantitative evaluation of the NECEC proposals did not appear to take into consideration Hydro Quebec's ability to deliver 110 MW of energy through the NECEC line for its own account above the 1090 MW of deliveries to the EDCs under the proposal. The IE expressed that it wasn't certain what the impact of incremental Hydro Quebec deliveries would be because there could be a reduction in the LMP at the delivery point in Maine, which would reduce direct benefits, but this could be offset or exceeded by indirect benefits, such as reductions in LMPs for Massachusetts EDC customers and GHG reductions. The IE raised the question whether an additional model run should be conducted. An additional model run, at the request of Eversource, was conducted by TCR after the Stage 3 evaluation and bid selection, which showed an increase in net benefits (the indirect benefit improvement outweighed the reduction in direct benefits), which would not have affected TCR's rank ordering of the bids. The results of this additional model run are summarized in Appendix F.



DOER pressed the Evaluation Team to reach a selection decision in accordance with the RFP schedule, which called for selection by January 25, 2018. On a conference call, the Evaluation Team discussed risk issues and other evaluation matters pertaining to a number of higher-ranked projects.

Due to time limitations, the Stage 3 evaluation focused on the two highest ranked mutually exclusive projects, NECEC Hydro and NPT Hydro. Aside from the NPT interest rate issue previously discussed, the IE suggested that the Evaluation Team confer with ISO-NE regarding potential and likely outcomes of the Maine Cluster process with respect to NECEC. A call was held between representatives of the ISO and the Evaluation Team, which was very informative.

#### D. Bid Selection

##### 1. Initial Selection

At a Steering Committee meeting held on January 18, 2018, the EDCs were asked which bid or bids they recommended for selection. Under 83D, if the EDCs unanimously agreed on the same bidder as the winning bidder, that bidder would be selected. Without unanimous agreement, DOER, after consulting with the IE, would make the final binding decision.

Eversource recommended the NPT hydro proposal. National Grid recommended the NECEC hydro proposal. The two EDCs provided reasons in support of their recommended selections. Unitil indicated that it had not yet reached a decision internally in order to make a recommendation. DOER asked the EDCs to meet separately to see if they could reach a consensus. If a consensus could not be reached, DOER asked each EDC to put their recommendations and supporting rationale in writing and to circulate their position papers the following day, which the EDCs did.

Eversource's rationale for selecting NPT was based in part on having the highest total net benefits, stated as a range of [REDACTED], and that those benefits would be delivered at the earliest date of the highest ranked proposals—prior to the end of 2020. Eversource stated that the [REDACTED] percent interest rate for NPT was "likely optimistic given changes in interest rates since the bids were submitted in July 2017," and that "[w]ithin the range selected by the Evaluation Team of [REDACTED] and 4.45 percent (high), NPT is the highest scoring project in terms of Total Net Benefits to customers" (using the NPV \$ metric). Eversource argued that net present value results are a better economic indicator of value to Massachusetts customers than real levelized \$/MWh for projects of similar size. On a variety of other factors, such as being more advanced in the permitting and interconnection process, Eversource rated NPT as a superior choice compared to NECEC.

Unitil rated NECEC and NPT as being similar with respect to quantitative net benefits but viewed NPT as a more mature project posing much less viability risk. In addition, it viewed the earlier projected on-line

date of NPT as creating more value for Massachusetts customers. Unitil recommended the selection of NPT.

In explaining its rationale for selecting NECEC, National Grid stated that using the real levelized \$/MWh metric, the NECEC project's net benefits of \$40.02/MWh was superior to that of NPT's \$ [REDACTED] MWh and the total score was higher, 90.63 points to [REDACTED], using the 4.45% interest rate supported by the Evaluation Team consultant and the IE.<sup>61</sup> Even using the total \$ NPV metric, the NECEC project—\$3.9 billion—was higher than NPT's \$ [REDACTED] billion. Also, the levelized \$/MWh cost of the NECEC contracts were lower—\$59/MWh to [REDACTED]/MWh. National Grid stated that qualitative differences in the proposal were already captured in the qualitative scoring, with NPT scoring [REDACTED] higher. National Grid stated that NPT Hydro's claim that it will meet a December 2020 on-line date was highly doubtful, given that it would have to place [REDACTED] million at risk to do so, and that its [REDACTED].<sup>62</sup> National Grid also stated that NECEC's fixed price bid provided less cost risk for customers than NPT's bid.

Given that the EDCs did not agree, the selection decision moved to DOER. On January 18 and January 24, DOER met with the IE in connection with the consultative process prescribed by 83D prior to a final DOER selection decision. The IE provided similar advice to DOER as it had given to the Evaluation Team as a whole regarding guidelines for selection. The IE advised that the starting point of the evaluation should be the quantitative and qualitative scoring under Stage 2 and Stage 3, with the quantitative evaluation to be based on the 4.45% interest rate for NPT rather than the bidder estimate of [REDACTED]%. Further, the IE suggested that the decision should be between the two highest ranked projects—NECEC Hydro and NPT. Beyond that, the IE suggested that DOER could consider a number of factors allowed to be considered in Stage 3 under the RFP and the evaluation protocol, which may include relative value regarding meeting GWSA goals, project viability, and ratepayer risk and benefit issues not fully captured in the Stage 2 evaluation.

On January 25, 2018, DOER announced its selection of NPT Hydro as the winning bid. DOER provided a memo to the IE setting forth the basis for its decision. First, DOER noted that its decision was based on

<sup>61</sup> National Grid stated that it provided data supporting a debt financing rate of 5.0%. National Grid noted that NECEC had used a 5.0% percent interest rate assumption to formulate the NECEC transmission rate proposal and that NPT had used a [REDACTED] interest rate assumption in its bid in the multi-state Section 83A solicitation. National Grid also asserted that NPT's assumed debt financing rate of [REDACTED] percent was dismissed by the Evaluation Team as unrealistic and a debt financing rate of 3.6 percent proposed by Eversource was also unrealistically low.

The 3.6 percent interest rate was based on the use of current forward prices for future interest rates quoted by Bloomberg, specifically, an indication of what traders would commit to currently (January 24, 2018, in this case) with respect to interest rates several years in the future, rather than a forecast of what interest rates are likely to be several years in the future [REDACTED]

<sup>62</sup> [REDACTED]

an assumed 4.45% interest rate for NPT, rather than the bidder supplied estimate of [REDACTED] DOER also noted that the two projects utilize the same Hydro Quebec generating resources and would deliver similar quantities of energy through two new alternative transmission lines. DOER stated that after careful consideration it believed that the NPT project would provide the greatest value to Massachusetts customers based on a number of reasons, including the following:

- A proposed in-service date two years earlier than NECEC's, supporting a stronger likelihood of an earlier in-service date
- More progress in the permitting and interconnection processes, providing additional certainty that the project will be constructed earlier
- Similar net benefits to Massachusetts ratepayers<sup>63</sup>
- By coming online earlier, a likelihood of additional and earlier GHG tonnage reduction assisting the Commonwealth in meeting GWSA requirements
- Providing insurance benefits against winter price spikes and gas supply constraints at an earlier time than NECEC, mitigating significant winter reliability concerns.

While both NPT and NECEC were expected to provide cost-effective clean energy, DOER concluded that NPT's greater certainty for an earlier in-service date gave it the advantage as the winning bid in light of the urgent need to meet GWSA goals, as well continuing concerns for near-term winter reliability stresses on the regional electric grid exacerbated by pending generator retirements.

Based on this decision, the EDCs sent a letter to NPT and HRE notifying them that the NPT Hydro proposal was selected for contract negotiations.

On January, 31, 2018, DOER recommended, and the EDCs agreed, that the IE continue to monitor the next phase of the procurement, including contract negotiations. At the time, the expected contract negotiations were with Northern Pass, Eversource's affiliate, as well as HRE. This was beyond the IE's original scope of work, but resulted in an additional level of oversight.<sup>64</sup>

<sup>63</sup> In its memo to the IE, DOER stated that "in terms of net benefits to Massachusetts ratepayers, the projects are within [REDACTED] % of each other, both delivering approximately [REDACTED] in net benefits to ratepayers." Given benefits of [REDACTED] billion for NPT (using the assumed 4.45% cost of long-term debt) and \$3.904 billion for NECEC, the difference is actually [REDACTED] %. However, the essential point is that DOER did not view the difference in quantitative benefits between the two projects as being sufficiently large to rely on in making its decision (absent other considerations) and that qualitative advantages for NPT (as further described in the memo) were determinative.

<sup>64</sup> Peregrine had originally recommended that monitoring of contract negotiations be included in the IE's scope of work, which is common for independent evaluators, but this was not included due to objections by the EDCs. Peregrine monitored the contract negotiations, which were mostly conducted on conference calls. As part of the arrangement with DOER and the EDCs, Peregrine was not provided with drafts of contracts or email exchanges with the bidders, but was allowed to review contract drafts by WebEx. The IE was also invited to internal calls with the EDCs and was provided with the opportunity to comment or ask questions on those calls.

## 2. NPT Denied Siting Approval; Evaluation Team Selects Conditionally Selects NECEC

On February 1, 2018, one week after NPT was selected as the winning bidder, the New Hampshire Site Evaluation Committee voted unanimously to reject Northern Pass' application for siting authority.<sup>65</sup> Without the NHSEC's approval, Northern Pass would not have the authority to construct its proposed project.

The next day, DOER sent a letter to the EDCs requesting that the EDCs send a letter to Northern Pass seeking information on the status of the project in light of the NHSEC's recent action and what the project's plans were to address the denial.<sup>66</sup> DOER also sought an early meeting with the EDCs and the IE to discuss the matter. On February 5, the EDCs sent a letter to NPT, asking whether and how the NHSEC decision affected Northern Pass's bid, including the proposed commercial operation date, and to describe the company's plans to reverse the NHSEC decision or otherwise obtain NHSEC approval. NPT responded that it would seek rehearing of the NHSEC decision and appeal it, if necessary. [REDACTED]

Soon thereafter, the EDCs and DOER met to consider NPT's responses and how to proceed. National Grid proposed that negotiations be commenced with NECEC, while negotiating at the same time with NPT, thereby giving Northern Pass some time to go through the NHSEC rehearing process. Eversource and Unitil recommended staying the course with NPT. The result of the conference call was that DOER would make a final binding decision regarding the course of action if the EDCs could not agree. A second conference call was held several days later.

DOER expressed the view that the fact of NPT's permit denial was very problematic and that the focus should be on the Massachusetts RFP timetable for decision, with a March 27, 2018 date for contract execution, not the timetable in the NHSEC process. The EDCs reiterated their position from the prior meeting.

The IE suggested that the Evaluation Team consider [REDACTED] as well as NECEC in deciding on an alternative project/project portfolio with which to negotiate, stating that while [REDACTED] was ranked below NECEC, it was ranked only slightly lower than NPT and it had a higher qualitative evaluation score because [REDACTED]. After a brief discussion, the EDCs unanimously stated their preference for NECEC over [REDACTED] due to NECEC's lower cost.

<sup>65</sup> Transcript of February 1, 2018 hearing at 24-26, NH SEC Docket No. 2015-06, [https://www.nhsec.nh.gov/projects/2015-06/transcripts/2015-06\\_2018-02-01\\_transcript\\_delib\\_day3\\_pm.pdf](https://www.nhsec.nh.gov/projects/2015-06/transcripts/2015-06_2018-02-01_transcript_delib_day3_pm.pdf).

<sup>66</sup> [https://macleanenergy.files.wordpress.com/2018/02/letter-from-doer-asking-edcs-for-decision\\_02022018.pdf](https://macleanenergy.files.wordpress.com/2018/02/letter-from-doer-asking-edcs-for-decision_02022018.pdf).

With disagreement among the EDCs regarding the terms under which negotiations would proceed with both NPT and NECEC (as the alternative selected project),<sup>67</sup> DOER decided that NECEC should be given the opportunity to negotiate a contract while negotiations also proceed with NPT, with discontinuance of contract negotiations with NPT and termination of its conditional selection if NPT did not obtain NHSEC approval by March 27, 2019. NECEC and NPT were asked to accept the terms of their conditional selections, which they did.

Following execution of confidentiality agreements, the two sets of negotiations commenced: a TSA with NPT with an associated PPA with HRE; and a TSA with CMP and an associated PPA with HRE. Negotiations and preparation for them were affected by several snowstorms, which slowed the process.<sup>68</sup>

Negotiations proceeded for several weeks in March with both NPT and NECEC. On February 28, NPT had filed a request for rehearing with the NHSEC, which had been objected to by multiple parties. On March 13, the NHSEC ruled that it would issue a final written order (it had not yet memorialized its oral decision into a written order but had previously stated it would do so by March 31), and allowed another 10 days (under its rules) for any party to seek rehearing of its order.<sup>69</sup> There was no indication of any intent to reverse the unanimous oral decision denying NPT's application.

The 83D Steering Committee met on March 26, 2018. Prior to the meeting, DOER circulated draft letters for review by Steering Committee members (with NECEC and NPT as addressees), which stated that if NPT received its NHSEC permit by March 27, the EDCs would continue negotiations with NPT and terminate those with NECEC; alternatively, if NPT did not receive its NHSEC permit by that date, the EDCs would terminate NPT's conditional selection and continue negotiations with NECEC. At the ensuing Steering Committee meeting, National Grid supported terminating negotiations with NPT and continuing negotiations with NECEC. Eversource opposed terminating negotiations with NPT, indicating that the bidder should be given more time to reverse the denial and obtain the required permit, and that negotiations should continue with both NPT and NECEC, with a decision on which deal to execute to be made at the end of the negotiations. Unitil stated that given the difference in opinion between Eversource and National Grid, it was up to DOER to make the final selection decision.

The IE agreed that the decision at hand was a selection matter, and, under 83D, it was a matter for DOER to decide. The IE expressed the view that the decision implicit in DOER's draft letters was consistent with the prior Steering Committee decision. The IE also indicated that the likelihood of NPT

<sup>67</sup> The different approaches are reflected in letters from National Grid to DOER dated February 12, 2018 and from Eversource to DOER dated February 14, 2018.

<sup>68</sup> This was primarily due to EDC personnel needing to perform storm duty.

<sup>69</sup> Order Suspending Decision, Docket No. 2015-06. [https://www.nhsec.nh.gov/projects/2015-06/orders-notice/2015-06\\_2018-03-12\\_order\\_suspend\\_decision.pdf](https://www.nhsec.nh.gov/projects/2015-06/orders-notice/2015-06_2018-03-12_order_suspend_decision.pdf).



being able to reverse the NHSEC decision and obtain its permit within any reasonable timeframe was remote. Further, the IE expressed the view that Eversource's continuing effort to keep NPT in the running represented favoritism or at least the appearance of favoritism toward its affiliate. DOER indicated that given the situation it was virtually impossible for NPT to make its scheduled 2020 online date, which was a major reason for its selection, and the unanimous permit denial made it very questionable whether the project could be built within the scope of its bid or at all. As a result, DOER decided that if NPT did not receive its permit by March 27, its conditional selection would be terminated and that contract negotiations would continue with NECEC. Subsequently, the EDCs terminated contract negotiations with NPT.<sup>70</sup>

#### IV. Monitoring the Contract Negotiation Process

After the NECEC 100% hydro bid became the sole project with which the EDCs were negotiating, the negotiations proceeded in earnest with respect to the proposed PPA, the proposed TSA, and how these agreements interacted with each other. The IE monitored the negotiations and reviewed them from several perspectives:

- Were the resulting product of the negotiations (PPA and TSA) no less advantageous from an EDC customer standpoint than the bids submitted by CMP and HRE (such that the contracts as negotiated would be consistent with the bids as evaluated)?
- Were the resulting product of the negotiations (PPA and TSA) conforming with the requirements of the RFP?
- Did the EDCs negotiate in good faith and treat the winning bidders fairly?
- Was there any evidence of undue discrimination against the NECEC bid sponsors because they were not affiliates of any of the EDCs?

Since CMP or HRE are not affiliates of any of the EDCs, there was no issue of preferential treatment of an affiliate.

These matters are addressed in Section V.D of this report.

<sup>70</sup> On March 30, 2018, the SEC issued its written order denying NPT's application for site authority. [https://www.nhsec.nh.gov/projects/2015-06/orders-notices/2015-06\\_2018-03-30\\_order\\_deny\\_app\\_cert\\_site\\_facility.pdf](https://www.nhsec.nh.gov/projects/2015-06/orders-notices/2015-06_2018-03-30_order_deny_app_cert_site_facility.pdf). Subsequently, NPT filed for rehearing, which the NHSEC denied at a hearing held on May 24, 2018, [https://www.nhsec.nh.gov/projects/2015-06/transcripts/2015-06\\_2018-05-24\\_transcript\\_rehearing\\_deliberations\\_am.pdf](https://www.nhsec.nh.gov/projects/2015-06/transcripts/2015-06_2018-05-24_transcript_rehearing_deliberations_am.pdf), and memorialized in a written order issued on July 12, 2018, [https://www.nhsec.nh.gov/projects/2015-06/orders-notices/2015-06\\_2018-07-12\\_order\\_mtn\\_rehearing\\_mtn\\_strike.pdf](https://www.nhsec.nh.gov/projects/2015-06/orders-notices/2015-06_2018-07-12_order_mtn_rehearing_mtn_strike.pdf).

## V. Analysis of Solicitation, Bid Evaluation, Selection and Contract Negotiation Process

In this section of the report, we review the fairness of the bid evaluation framework and the evaluation and selection of bids. We do this in the context of the 83D criteria of an “open, fair and transparent solicitation and bid selection process that is not unduly influenced by an affiliated company” and the *Edgar-Allegheny* FERC principles.

### A. Process Issues: Transparency and Independent Oversight; Disclosure of Affiliate Relationships

#### i. Transparency

According to the *Edgar-Allegheny* principles, transparency is the free flow of information to all prospective and actual bidders. No party, particularly the affiliate should have an informational advantage in any part of the solicitation process. Transparency also means that the RFP and all relevant information should be released to all potential bidders at the same time. All aspects of the competitive solicitation should be widely publicized. The issuer can post the RFP on its website and issue a press release to that effect and/or advertise in the trade press. Also, to compete effectively, all bidders should have equal access to data relevant to the RFP and such information should be made available to all bidders at the same time. Transparency is also an objective from the standpoint of the public.

The Distribution Companies and DOER took a variety of steps to comply with the transparency principle. The Evaluation Team created and maintained a publicly available website (<https://macleanenergy.com>) which contained all relevant documents for prospective bidders, which were made available to them at the same time. The website contained the following types of information relevant to 83D:

- 83D documents
  - RFP and bidder response forms
  - Model PPAs for different types of generation bids and list of requirements applicable to transmission proposals
  - Form of notice of intent to bid
  - Standards of Conduct
  - EDC Evaluation Team members
  - Department order approving RFP for issuance
  - Stakeholder comments to EDCs prior to Distribution Company filing draft RFP for approval
- RFP timeline
- Bidder conference presentation
- Evaluation Team responses to prospective bidder questions
- Public versions of submitted bids

- Various posts regarding the selection of NPT, the decision to conditionally select NECEC after NH SEC's denial of NPT's application for site approval, and the termination of the conditional selection of NPT

The Distribution Companies and DOER acted to make the RFP known to a wide group of stakeholders. Before submitting the draft RFP to the Department for approval, the Distribution Companies sought comments from over 600 stakeholders on certain questions important to the design of the RFP and evaluation of bids, <https://macleanenergy.com/2016/12/19/83d-stakeholder-comments-requested/>, and posted the responses of over 30 commenters.<sup>71</sup> The RFP was then vetted with the Department, which allowed for participation by interested parties. Following the Department's approval of the RFP for issuance, the Distribution Companies notified an extensive list of prospective bidders and interested parties regarding the launch of the RFP, as they had in past solicitations.<sup>72</sup> Finally, the reports issued by the Independent Evaluator, including the report previously submitted on RFP design and this report regarding the bid evaluation and selection process, facilitate the transparency of the process.

In addition, the Distribution Companies which expected to receive affiliate bids—National Grid and Eversource—developed Standards of Conduct designed to ensure that affiliates have no competitive advantage for gaining access to information that is not available to third-party bidders. Under the pertinent Standard of Conduct, National Grid and Eversource designated the individuals participating in the Solicitation process, and identified the role of each individual in the process. Utility individuals were allowed to be on either a Bid Team or an Evaluation Team within their respective companies (Unitil only had an Evaluation Team). No individual was allowed to be a member of both teams, and no individual was permitted to change from one team to the other during the solicitation process. However, some individuals who are neither members of the Bid Team or Evaluation Team but who provide guidance or advice to the Bid Team and/or Evaluation Team in the normal course of their responsibilities could be designated as Subject Matter Experts ("SMEs") and could communicate with members of both teams, although they could not be conduits for confidential information pertaining to the RFP. The Distribution Companies published the names of the individuals designated to be on the Evaluation Team and those designated as SMEs on the solicitation website. All team members were required to sign an agreement acknowledging that they would be bound by the Standard of Conduct and will be subject to training on the Standard of Conduct.

The IE had the opportunity to review and comment on the proposed Standards of Conduct. The IE expressed that it would be preferable that joint use of SMEs not be used in order to reduce the risk of transfer of confidential information between Bid Team and Evaluation Team and to enhance the

<sup>71</sup> <https://macleanenergy.com/83d/83d-archived-documents-and-stakeholder-comments/>. The distribution list is derived from prospective bidders and other interested parties who signed up to receive notifications regarding the multi-state Clean Energy RFP and its associated website, <https://cleanenergyvrfp.com>.

<sup>72</sup> The Distribution Companies used the same distribution list as it used to solicit comments, as updated.

appearance of fairness and impartiality.<sup>73</sup> However, the IE stated that joint use of SMEs would be acceptable, with several modifications, including posting of the names of SMEs on the solicitation website and limiting the use of SMEs, which the Distribution Companies agreed to implement.<sup>74</sup> The Department approved this approach.<sup>75</sup>

At the end of the process, after the contracts with HQUS and CMP had been executed, the IE asked National Grid and Eversource to state in writing whether they had complied with the standards of conduct. They responded affirmatively.

During the pendency of the RFP, the Evaluation Team did not provide the detailed evaluation framework or a summary of it to prospective bidders or the public. This is a common practice in the implementation of complex solicitations, such as 83D, and has been the Distribution Companies' practice in past solicitations. The rationale behind the practice is to encourage prospective bidders to put their best proposal forward rather than to facilitate their "gaming" of the evaluation system. In addition, putting together and making public a summary of the detailed evaluation framework prior to the submission of bids would have put an additional burden on the Evaluation Team, which was already struggling with timely meeting milestones for the solicitation process. Compliance with the transparency principle is typically assessed in the context of other procurement objectives and exigencies. In the IE's view, the principles of the evaluation framework set forth in the RFP, the bidder response package in the RFP, and the responses and public posting of over 100 bidder questions provided sufficient guidance for bidders to be able to submit competitive bids and for bidders to have a sufficient level of understanding as to basis upon which their bids would be evaluated.

Overall, the Distribution Companies and DOER implemented the RFP process in a manner that was open and that satisfies the transparency principle, in the IE's opinion.

## 2. Independent Oversight

The *Edgar-Allegheny* oversight principle provides that effective oversight of competitive solicitations can be accomplished by using an independent third-party with respect to the design and implementation of the competitive solicitation process. Ensuring that the third-party is independent and granting it at the outset oversight responsibility will help to ensure that the process will be conducted fairly throughout the process and will also minimize perceptions of affiliate abuse. 83D requires the appointment of an independent evaluator—selected jointly by DOER and the AGO—to monitor and report on the solicitation process and to provide its independent assessment of whether all bids were evaluated in a fair and non-discriminatory basis.

<sup>73</sup> IE RFP Design Report at 9-11.

<sup>74</sup> *Id.*

<sup>75</sup> D.P.U. 17-32 at 53-55.

Structurally, the 83D solicitation process contains numerous provisions for the independent oversight of the process. During the 83D RFP design phase, the process was subject not only to the independent oversight by the IE but also involved participation by DOER and the AGO. Importantly, the proposed RFP was the product of an agreement between three different Distribution Companies and DOER, and was subject to the Department's review and approval, after allowing comments by interested parties. Thereafter, DOER was a member of the Evaluation Team with the Distribution Companies and was intimately involved in developing the detailed evaluation framework, evaluating bids, and bid selection, with the IE actively involved in oversight of the entire process. DOER and the IE both had the opportunity to monitor contract negotiations between the Distribution Companies and selected bidders.

Solicitation processes have different strengths and weaknesses with respect to the oversight principle (as well as other considerations). While the degree of independent oversight was very strong, as outlined above, the process also had a few weaknesses. The IE was not brought into the deliberations regarding the RFP design until several weeks after they commenced. However, the IE had the opportunity to review drafts of the RFP and issues lists and participate in discussions with the Distribution Companies, DOER and the AGO on RFP design issues, so the impact was *de minimis*.

Another weakness was the limitations on IE (and DOER) access to draft contracts and substantive emails between the EDCs and the winning bidders during contract negotiations. The IE was only allowed physical access to these documents without the ability to retain them. Typically, the industry practice is that the IE is copied on all communications between bidders and the utilities, including throughout contract negotiations. However, the IE was able to monitor the contract negotiations throughout, provide comments to the EDCs during intra-EDC conference calls, and review the draft documents in person on request.

On the whole, there was strong independent oversight over the entire process.

### 3. Disclosure of Affiliate Relationships

The Independent Evaluator provided input into provisions of the RFP, the form of bidder certification, and the bidder response package to require bidders to identify any affiliate relationship with a Distribution Company or any financial interest that a Distribution Company had with the bidder or the proposed project.<sup>76</sup> The purpose of this was to ensure that there are no proposals where a Distribution Company has an undisclosed affiliate or financial interest in a bidder or proposed project. The IE had, as a team member, a forensic accountant, who provided assistance on these matters.<sup>77</sup> The accounting firm, Meaden & Moore, concluded that the utility affiliates who submitted bids, Northern Pass, Granite

<sup>76</sup> RFP sections 1.8, 2.2.1.5, and parts of Appendix B, Section 5.

<sup>77</sup> The use of a forensic accountant for this purpose was required, or at least encouraged, in the DOER RFQ for independent evaluator services.



State Powerlink, and Northeast Renewable Power Partners, properly disclosed their affiliate relationships, and that there were no bidders that failed to properly disclose any affiliated relationships.

## B. Fairness of the Bid Evaluation Framework

An important part of the RFP process is the evaluation framework that is described in the RFP and the detailed evaluation framework that is developed to implement the provisions of the RFP. Under the *Edgar-Allegheny* principles, there are two guidelines that are of particular applicability to this part of the solicitation process—product definition and evaluation.

In *Allegheny*, FERC stated with respect to the “product definition” guideline:

The product or products sought through the RFP should be defined in a manner that is clear and nondiscriminatory. The RFP should state all relevant aspects of the product or products sought.

An RFP should not be written to exclude products that can appropriately fill the issuing company’s objectives. This is particularly important if such exclusions tend to favor affiliates.<sup>78</sup>

Another of the four *Allegheny* criteria is:

Evaluation: evaluation criteria should be standardized and applied equally. . . .

To fulfill the evaluation principle, RFPs should clearly specify the price and nonprice criteria under which the bids are evaluated.<sup>79</sup>

In this section of the report, the evaluation framework set forth in the RFP and the detailed evaluation framework developed after the RFP was issued will be analyzed in terms of (a) fairness and non-discrimination toward any types of bids and non-favoritism toward affiliates and (b) whether the detailed evaluation framework fairly implemented the more general provisions of the RFP. For purposes of this section of the report, the detailed evaluation framework includes the evaluation protocols developed after the RFP was issued, written answers to bidder questions, and the base case developed in connection with the evaluation of bids.

### 1. Interconnection Requirements

There are three principal requirements in the RFP pertaining to interconnection and delivery.

- Bidders are required to interconnect to the ISO-NE grid based on the CCIS (as well as the minimum interconnection standard);

<sup>78</sup> 108 FERC ¶ 61,082 (2004) at 8.

<sup>79</sup> 108 FERC ¶ 61,082 (2004) at 7, 8.

- Bidders must demonstrate that their proposed delivery into the ISO-NE grid, along with proposed transmission network upgrades, is sufficient to ensure “full dispatch” of the proposed clean energy deliveries; and
- Bidders that do not have certain interconnection studies completed by ISO-NE are required to submit technical reports or system impact studies under the current serial study process, even though ISO-NE was at the time in the process of converting to a cluster study process, subject to FERC approval, which affected certain projects in Maine.

In our RFP Design Report, the IE concurred with the use of the CCIS standard in the 83D solicitation (pp. 13-15), recognizing that this higher standard of interconnection than the “energy only” standard for Network Interconnection Service required in prior solicitations under Section 83 and 83A was justified in the context of 83D’s greater emphasis on reliability, noting the 83D statutory criteria that clean energy generation “contribute to reducing winter electricity price spikes” and “guarantee energy delivery in winter months.”

However, the IE was uncomfortable with the requirement that bidders demonstrate that proposed delivery, along with transmission network upgrades, is sufficient to ensure “full dispatch” of proposed energy deliveries. There is no ISO-NE study or requirement that is based on that standard. In fact, the “full dispatch” standard is substantially stricter than the CCIS standard, and ISO studies do not review for “full dispatch.” Moreover, how to “ensure” full dispatch is unclear, which is undesirable for a RFP threshold requirement. Finally, the issue of transmission constraints and impacts on delivered energy prices and project curtailment can, and was planned to be, evaluated in the quantitative nodal energy market simulation modeling.

The Evaluation Team addressed this issue, with the input of the IE, in response to a bidder question, with the answer posted to the RFP website. After explaining that a bidder would need to provide an ISO study based on the CCIS standard or a technical study provided by the bidder that would approximate an ISO study, the Evaluation Team explained:

The delivery profile submitted by the bidder should reflect any remaining projected constraints or curtailments, if any, associated with the proposal (after inclusion of any network upgrades associated with application of the CCIS-equivalent interconnection standard). If a bidder desires to reduce further any constraints or curtailments associated with its proposals, it must identify additional network upgrades (which would be instituted through an elective process with ISO-NE), estimated costs to achieve this result, proposed cost containment measures, and the delivery profile associated with the proposed level of network upgrades, all with supporting studies and information.<sup>80</sup>

<sup>80</sup> Answer to Question 16, 83D Q&A Set 8. <https://macleanenergy.files.wordpress.com/2017/03/83d-ga-set-8.pdf>.

In practice, the Evaluation Team interpreted “full dispatch” as an obligation to incorporate any expected curtailments in the delivery profile submitted by the bidder, plus a bidder option, rather than a requirement, to identify additional upgrades to achieve “full dispatch.” The IE found this approach to be reasonable.

Following the issuance of the RFP, ISO-NE proposed to FERC modifications to its interconnection process to provide for a cluster study process for certain projects interconnecting in Maine, which FERC approved on October 31, 2017 and made effective on November 1, 2017.<sup>81</sup> The Evaluation Team applied the interconnection requirements applicable to cluster-eligible projects under FERC’s revised rules (to the extent different from pre-existing requirements), both from a threshold requirements standpoint and in its qualitative evaluation of bids. The IE concurred with this approach, which relied on currently effective rules.

There were a number of bidders that sought clarification regarding the standards the Evaluation Team would apply based on the applicable RFP provisions. The Evaluation Team provided clarification in written responses, after seeking input from ISO-NE, with the answers being reviewed and concurred in by the IE.<sup>82</sup> On the whole, the IE was satisfied that the interconnection requirements in the RFP as further interpreted in answers provided to bidders were designed and articulated in a fair, clearly stated, transparent and non-discriminatory manner.

## 2. Detailed Evaluation Framework

The Evaluation Team devoted considerable time and effort to develop a detailed quantitative evaluation framework pursuant to the more general provisions set forth in the RFP. The model used by TCR—ENELYTIX—allowed for more sophisticated quantitative evaluation than in prior solicitations. Also, this was the first Massachusetts RFP process where GWSA compliance value was part of the evaluation process. Finally, the evaluation process evolved following enactment of the CES and Evaluation Team review of initial quantitative results, with the concurrence of the IE.

The evaluation framework properly considered the projected market value of energy purchased under the proposed contracts. This was based on running ENELYTIX with the proposed project in service and determining the value of energy at the proposed delivery point. This is the point at which the EDCs would purchase the proposed energy (and, in all likelihood, sell the energy back into the market at the same point).

The environmental attributes and the market products embodying them were incorporated in the evaluation in three ways:

<sup>81</sup> ISO New England Inc., 161 FERC ¶ 61,123 (2017).

<sup>82</sup> See answers to questions 15, 16, 31, 36, 72, 82, 117, 118, and 119, 83D Q&A Set 8. <https://macleanenergy.files.wordpress.com/2017/03/83d-ga-set-8.pdf>

- The direct benefits associated with RECs and CECs
- The indirect benefits associated with the reduction of REC and CEC prices that EDCs and other retail electric suppliers would need to pay for these products other than those that the EDCs are or will be procuring under long-term contracts
- The value associated with reduction of emissions pursuant to the GWSA

At the time the RFP was issued, the Clean Energy Standard was a proposed rule (issued as a proposal in December 2016). The rules were finalized in August 2017 and then amended in December 2017. The evaluation performed incorporated the rules as they were finalized and amended. One major impact of the CES rules was that it greatly expanded the demand for clean energy—both RPS eligible generation and hydroelectric generation procured under 83D—and, hence, their value in the evaluation.<sup>83</sup>

Important aspects of the evaluation included:

- Using the ENELYTIX model, REC and CEC values are based on the “missing money” required to meet RPS and CES requirements above market energy value (and applicable capacity value), subject to ACP values under the RPS and CES, which act as price caps
- CEC values in many years were based on the ACP, which, in most years, is 50% of the RPS ACP value<sup>84</sup>
- Where RECs or CECs were projected to be used to serve EDC distribution load (Massachusetts retail load minus municipal utility load), the value of the RECs or CECs in the evaluation was assumed to be their avoided cost; where they were assumed to be surplus and sold, the value was based on the projected sale price.<sup>85</sup>
- The value of the RECs/CECs purchased were treated as a direct benefit of the project proposal.

<sup>83</sup> The CES requires Massachusetts retail suppliers (excepting municipal utilities) to obtain Clean Generation Attributes (including those from RPS Class I generating units) in amounts equal to 16 percent of their sales in 2018, increasing by 2 percent per year until 80 percent in 2050. 310 CMR 7.75(4). In contrast, the percentage requirement applicable to RPS Class I (subject to the solar carve outs) is 13 percent in 2018 and increases by 1 percent per year thereafter. 225 CMR 14.07.

<sup>84</sup> With respect to the RPS, it was assumed that merchant RPS qualifying generation would meet RPS demand beyond existing RPS qualifying generation, assumed imports, and projected offshore wind projects to be procured under 83C. The ENELYTIX model did not specifically “solve” for CES compliance, thus, did not assume that merchant generation would be built to meet CES demand (unless such CES-qualifying generation would be built for economic reasons). The IE was satisfied that these assumptions were reasonable in light of the relatively small amount of new large clean generation that has been built in the region in the absence of long-term contracts.

<sup>85</sup> Under 83D(h), “a distribution company shall retain renewable energy certificates that are not attributed to Class I renewable portfolio standard eligible resources.” Under the CES rules, as amended, all generation attributes retained under this statutory provision are clean generation attributes qualifying under the CES. 310 CMR 7.75(2) (definition of “Clean Generation Attribute”), which are clean generation attributes from hydro facilities procured under 83D. Under the amended rule, these retained CECs “shall be assigned to all end use customers served by all retail sellers subject to 310 CMR 7.75(4) [which exclude municipal electric departments and municipal light boards]”.

- The impact on future REC and CEC prices as a result of the proposed increment of RECs and CECs being created as a result of the proposed projects and the resulting impacts on the cost of RECs and CECs required to be purchased to serve Massachusetts retail load—an indirect benefit;
- The economic value on a \$/MWh basis associated with GHG emissions reductions attributed to Massachusetts under the GWSA based on the manner in which Massachusetts accounts for GHG emissions attributable to Massachusetts under the GWSA—using the GHG inventory accounting methodology, another indirect benefit.

The IE views the evaluation framework regarding environmental attributes, described in more detail at Section III.B.3.b. of this report, as being fair, non-discriminatory and reasonably based on the applicable statutory and regulatory provisions and practices under the RPS, CES, and GWSA. The IE appreciates that strong arguments can be made for the different approaches regarding whether the REC and CEC market values should be considered as being part of the GWSA compliance value—the position taken by DOER with the support of Eversource and Unitil—or whether it should be considered as separate and distinct and therefore additive—the position taken by National Grid. As previously indicated in this report, the IE supports the approach taken by DOER, with the support of the majority of the Evaluation Team, primarily because deference should be given, in the IE’s opinion, to the agency and its sister agency, DEP, who are charged with implementing the pertinent statutes and regulations and which are responsible for energy and environmental policy.<sup>86</sup> As it turned out, the different approaches regarding environmental attribute valuation did not appear to make a major difference in the evaluation results when different projects/portfolios were compared against each other. NECEC Hydro was the top-ranked portfolio based on the real levelized \$/MWh evaluation metric under both approaches.

Another indirect benefit was the impact of the project proposals on projected energy prices for Massachusetts EDC customers, which was an output from the ENELYTIX modeling. For most of the project proposals, this was a benefit, as injecting low marginal cost energy into the grid would reasonably be expected to reduce LMPs throughout New England, in the absence of material transmission constraints. Based on the initial evaluation results for small projects, it appeared that the outputs reflected modeling “noise” more than reasonable energy price changes, especially because the LMP price increases or decreases were divided by a small number of project MWhs to produce a \$/MWh value. It was reasonable, in the IE’s opinion, not to include the energy price change value (as well as other indirect benefits) in the evaluation of individual small projects, but to include it in both the Stage 2

<sup>86</sup> While Evaluation Team members may certainly assert their right to express their opinions regarding evaluation framework matters, it is difficult to manage a decision making process operating on a consensus basis where dissenting parties are unwilling to accede to the majority. At least, there was only one instance of this occurring. The IE does not know whether this was due only to a strongly held opinion of National Grid or whether it was influenced by the likelihood that National Grid’s preferred approach would be more favorable to National Grid’s affiliate wind and wind/hydro bids than the approach preferred by other members of the Evaluation Team (one of which, it should be noted, had an affiliate hydro and hydro/wind bid).



evaluation for large projects and the Stage 3 portfolio evaluation, which included aggregations of small projects in a number of the portfolios created for Stage 3.

The IE was also comfortable with the “hedge value” that TCR created to measure the extent to which a proposal/portfolio would mitigate price increases in the winter months due to unusually high natural gas prices in the winter months. In the IE’s opinion, this was a reasonable way to address the “economic impacts associated with resource firmness,” a criterion set forth in Section 2.3.1.2 of the RFP and 83D’s criterion of “contribut[ing] to reducing winter electricity price spikes.”<sup>87</sup> The particular formulation was the result of a collaboration with the Evaluation Team and TCR after consideration of several alternative approaches.

Other potential quantitative evaluation measures were considered but were not included for reasons that the IE found to be sound—such as the future impact on the needs for additional ancillary services and associated costs associated with intermittent generation, because of the lack of appropriate data. Another instance was the decision not to use outputs of the ENELYTIX model regarding the impact on capacity prices, because the model results did not appear to be reliable and consistent and that recent changes to ISO-NE’s Competitive Auctions with Sponsored Resources (“CASPR”) proposal made it less likely that new state-sponsored resources would impact capacity market prices.<sup>88</sup> These factors, however, were generally considered in the qualitative evaluation under the “Reliability” category.<sup>89</sup>

The IE found the detailed qualitative evaluation framework—which addressed indicia of project viability, benefits not quantified in the quantitative evaluation, and cost and contractual risks not considered in the quantitative evaluation—to be reasonably based on the provisions of the RFP, fair to different types of allowable bids, and consistent with the statutory intent of 83D. The Stage 3 evaluation protocol followed the RFP provisions applicable to Stage 3.

The resulting evaluation framework was standardized for application to all proposals and portfolios of proposals and, in the IE’s opinion, was fair and non-discriminatory toward all proposals and not unduly influenced by the fact that there were several bidders who were affiliates of two of the EDCs.

In addition, the products being solicited—energy and RECs for RPS Class 1 resources and energy and environmental attributes for hydro resources—along with variants involving combinations of the foregoing products and for proposals involving proposed transmission projects were, in the IE’s opinion, stated with sufficient clarity. This was improved through the question and answer process, pursuant to

<sup>87</sup> 83D(d)(5)(ii).

<sup>88</sup> FERC approved the CASPR proposal in March 2018. *ISO New England Inc.*, 162 FERC ¶ 61,205 (2018).

<sup>89</sup> Included for consideration in this category was the extent to which the proposed project MWhs were firm or firming, the percent of project MWhs proposed for delivery during winter and summer peak hours, the reduction in natural gas burn during winter months relative to project MWhs, whether the proposed project is being paired with energy storage, and whether a proposed project is being delivered to eastern Massachusetts, rest-of-system in ISO-NE that is neither import nor export constrained, or in an export-constrained zone.

which the Evaluation Team provided written answers to more than 100 questions posed by prospective bidders, which were posted on the RFP website.

There were, however, several weaknesses in the evaluation framework. One weakness was the lack of a form Transmission Service Agreement for transmission bidders, which would have focused bidders on desired terms and conditions and facilitated Evaluation Team review of the bids. However, this was not at all a fatal weakness, and was favored by the EDCs due to their lack of experience with these types of agreements in a competitive bidding context (in contrast to PPAs) and the desire to facilitate creative proposals.

Another weakness, in the IE's opinion, was a difference in the change in law requirements for RPS Class I project bidders and firm hydro bidders. For RPS Class I projects, if there was a change in law such that the RECs ceased to conform with RPS Class I eligibility criteria, the EDCs could purchase only the energy under the PPA at the price specified for energy and not pay for the RECs. For firm hydro bidders, there was no similar requirement if the generation attributes no longer complied with the CES due to a change in law. In the RFP design report, the IE recommended deletion of the change in law requirement applicable to RPS Class I projects "if RPS Class I RECs and the associated environmental attributes are being evaluated in a manner that is comparable to that of the hydro environmental attributes."<sup>90</sup>

While a weakness in terms of treating different types of generating resources fairly, the IE does not find this to be a major weakness in the context of the solicitation overall. First, the Department rejected the recommendation of the IE and several stakeholders to eliminate the RFP's RPS change in law requirement.<sup>91</sup> Hence, it was appropriate for the Distribution Companies to implement the RFP with that requirement. Second, the CES was made final after the submittal of bids, and the RFP and the form agreements for firm hydro bids were not structured with a change in law provision regarding the CES which was then not in effect. It would not have been fair to apply to firm hydro (or firming hydro) bids a requirement that they take CES change in law risk after they had submitted their bids. Moreover, these bidders had not been required to bid separate pricing for energy and CES-compliant attributes in a similar way that RPS Class I qualifying bids were required to provide separate pricing for energy and RECs so the firm hydro bids did not provide a mechanism by which CES change in law risk could be limited to a specified \$/MWh amount.

For the foregoing reasons, it is the IE's opinion that the evaluation framework overall was standardized, fair, non-discriminatory, and non-preferential.

<sup>90</sup> RFP Design Report at 22.

<sup>91</sup> Fitchburg Gas and Electric Company et al., D.P.U. 17-32 at 47-52.

## C. Fairness of the Bid Evaluation and Selection Process

### 1. Threshold Evaluation

As indicated in Section III.C.1 of the report, 17 of the 53 project proposals were determined not to meet eligibility and threshold requirements. This is an unusually large percentage of projects that were disqualified for failure to meet minimum requirements for a competitive solicitation of this type. The primary reasons were the unusually strict minimum standards set forth in the RFP—particularly with respect to the interconnection and delivery requirements, which was the cause for the majority of disqualifications. Other reasons for failure to meet minimum RFP standards were failure to demonstrate site control, failure to provide financial information/demonstrate financial viability, and ineligibility based on existing hydro facilities in ISO-New England not providing incremental hydro.

The Evaluation Team considered many bids that different members of the Evaluation Team claimed did not meet one threshold requirement or another. In some cases, there were different interpretations of what was or was not a threshold requirement or how it should be applied in the context of a particular proposal. The IE took the position that threshold requirements should be narrowly construed and that only bids that clearly failed to pass threshold/eligibility requirements after bidders were given an opportunity to cure any deficiencies (or even where the deficiency was not reasonably curable, to explain their situation relative to the RFP requirement). The IE was satisfied that the Evaluation Team's decisions to disqualify bids was justified based on the application of RFP requirements to the particular proposal.

There were several other bids that the Evaluation Team considered as to whether they should be disqualified, but for which there was not unanimity in support of disqualification. None of these bids were competitive in the Stage 2 and Stage 3 evaluations, so that any failure to disqualify these bids was not material to the result of the solicitation.

### 2. Stage 2 and Stage 3 Evaluation and Bid Selection

Key to evaluation and bid selection is whether the evaluation framework was properly followed and applied in the evaluation of specific proposals and done so on a non-preferential and non-discriminatory basis. This applies for the quantitative analysis, the qualitative evaluation, the Stage 3 evaluation process and bid selection.

The IE saw some issues with the evaluation and selection process. Based on our observations, Eversource favored, or had the appearance of favoring, NPT in various stages of the evaluation and selection process, especially toward the end. This included the deliberations with respect to the interest rate assumption in the quantitative evaluation and the qualitative evaluation with respect to several criteria, including [REDACTED]. This was also the case with respect to the Stage 3 and bid selection process, where Eversource focused on aspects of the evaluation, evaluation metrics and assumptions that supported selection of Northern

Pass. It was perhaps even more apparent when Eversource sought to keep NPT in play for contract negotiations even after the required New Hampshire siting approval was denied, with a remote possibility for a prompt reversal in order for Northern Pass to be able to build the project anywhere near the timeframe proposed.

However, the evaluation process conducted by the Evaluation Team, with the oversight of the IE, counteracted any favoritism on the part of Eversource, such that the IE was comfortable that the resulting Stage 2 and Stage 3 evaluations were fairly conducted and not unduly preferential toward any bid nor unjustly discriminatory toward any bid. As mentioned previously, some of the issues, such as the interest rate to be used in the quantitative evaluation for NPT, was not properly addressed until toward the end of the evaluation process. In the IE's opinion, a reasonable forecasted interest rate, rather than the bidder-supplied very low interest rate, based on then-current interest rate levels, should have been used in the Stage 2 evaluation. However, a reasonable forecasted interest rate was finally applied in the Stage 3 evaluation, and DOER's ultimate decision was based on the quantitative evaluation using the forecasted 4.45% interest rate recommended by TCR, the Evaluation Consultant, with the support of the IE and National Grid.

Ultimately, the decision regarding which proposal to select was made by DOER because the EDCs did not agree on the selection decision. DOER followed the directives of 83D and consulted with the IE prior to making a decision. Generally, DOER's decision to select Northern Pass (it's initial decision) was within the guidelines that the IE provided for decision making:

- The decision was among the two proposals that the EDCs had recommended for selection and which were the two top-ranked bids (other than mutually exclusive bid variants of which NECEC was the major component);
- DOER used the 4.45% interest rate forecast for NPT in its decision making, rather than the bidder-supplied [REDACTED] % estimate;
- DOER viewed the net present value benefits for NPT as being comparable to those for NECEC (they were within [REDACTED] percent).

DOER concluded that NPT deserved selection for a number of reasons (as set forth in the memo explaining DOER's determination):

- NPT had an earlier proposed on-line date and was more advanced in permitting and interconnection processes, supporting a stronger likelihood of an earlier on-line date
- By coming online earlier, NPT would provide additional and earlier GHG reductions assisting the Commonwealth in meeting GWSA requirements and providing earlier insurance benefits against winter price spikes

In the IE's opinion, DOER's decisional memo should have given more weight or at least referenced the quantitative evaluations of the proposals using the metric of real levelized \$/ MWh net benefits chosen

by the Evaluation Team and the scoring and ranking of the bids using that metric.<sup>92</sup> However, the IE was and is satisfied that DOER considered that the NECEC proposal was evaluated as having more net benefits in the quantitative evaluation. Moreover, the factors DOER cited in support of its decision were those that were proper for it to consider as the basis for its selection decision. Overall, it was the IE's opinion, that DOER's selection of NPT was one that was fairly made and within DOER's authority under the RFP and within the guidelines for decision set forth in the RFP and the Stage 3 evaluation protocol.

Following the decision by the NHSEC to deny NPT's siting authority permit a week later, DOER initiated a process that ultimately led to the conditional selection of NECEC, the termination of the conditional selection of NPT, and the negotiations leading up to the execution of agreements with HQUS and CMP. There was consensus among the EDCs that the NECEC bid was the best proposal to be the "back up" bid to NPT after NPT's site authority permit was denied. Again, it was DOER that ultimately decided to terminate NPT's conditional selection. The IE believed that the decision made by DOER was appropriate in the particular context, given the unanimous NHSEC permit denial and no indication that it would be reversed in time for NPT to start construction by [REDACTED], as proposed.<sup>93</sup> It also allowed the EDCs to focus negotiations on NECEC and the accompanying HQUS PPA, which facilitated the conduct and completion of the contract negotiations.

In the IE's opinion, the decision to select NECEC (first, as an alternative to NPT and, then, as the project for which contract negotiations would be conducted exclusively) was amply warranted. The NECEC 100% hydro proposal was the top-ranked proposal and was highest ranking in the quantitative evaluation. It also had the highest benefits based on NPV total \$, an alternative economic metric. While NECEC was at an early stage in the interconnection process, which was subject to the Maine cluster study process, and at a relative early stage in the permitting process as well, it, at least, had not received a unanimous denial of a required permit.<sup>94</sup> The next mutually exclusive bid in rank order was [REDACTED], which already had achieved many major project development milestones but had higher costs and lower net

<sup>92</sup> DOER's ranking of bids using both the real levelized \$/MWh metric and the NPV \$ alternative metric prior to selection and the IE's consultations with DOER prior to and after its selection decision indicate that DOER considered and did give some weight to the bid evaluations using the real levelized \$/MWh metric.

<sup>93</sup> Of note, Section 83D(d)(5)(vii) provides that a proposal must "adequately demonstrate project viability in a commercially reasonable timeframe." It is the IE's view that DOER's decision to terminate negotiations with a project whose key siting authority application had been unanimously denied by the siting authority was consistent with the statutory intent of 83D.

<sup>94</sup> [REDACTED]



benefits and a lower total score and ranking. The decision to select NECEC over [REDACTED] was fairly and reasonably made.

#### D. Contract Negotiation Process

As indicated previously, the IE monitored the contract negotiations, subject to limitations. However, the IE was able to discuss with the EDCs outside of the negotiations the scope and focus of the IE review and any matters that were of concern to the IE. Finally, the IE was able to review the contract drafts when negotiations were at an advanced stage and the final execution copies of the agreements.

There were several issues that were presented during the contract negotiation from the IE's perspective.

First, National Grid wanted to obtain a contractual commitment from HRE that it would deliver from HQ hydro resources a substantial amount of energy over the term of the 20-year HRE contract outside of the contract such that the deliveries under the 20-year HRE contract would be considered "Incremental Hydroelectric Generation" within the meaning of the RFP. Under the RFP, "Incremental Hydroelectric Generation" is defined as:

Firm Service Hydroelectric Generation that represents a net increase in MWh per year of hydroelectric generation from the bidder and/or affiliate as compared to the 3 year historical average and/or otherwise expected delivery of hydroelectric generation from the bidder and/or affiliate within or into the New England Control Area.<sup>95</sup>

In Section 4.1 of the Bidder Response Form (Appendix B to the RFP), hydropower bidders were required to provide the following information:

Describe why the generation proposal qualifies as Incremental Hydropower Generation. If the entire project is not new, specify the amount of power provided to or sold into the ISO-NE market during 2014, 2015, and 2016. Provide information which demonstrates that the resources and transmission capacity described in your proposal are capable of providing an increase in the amount of such power compared to the average power deliveries in ISO-NE over those three years.

The form PPA did not contain any specific provision requiring that a seller of existing hydropower generation deliver any amount of energy other than that being committed to under the proposed contract. Neither the IE, the other EDCs nor DOER agreed with National Grid that the RFP or form PPA required the type of commitment that National Grid was seeking [REDACTED]. Imposing a major obligation or liability on a bidder that was not contemplated by the form PPA and was not included within the scope of a bidder's proposal raised a fairness question. However, the IE noted that this

<sup>95</sup> 83D RFP, p. B.

matter had been raised by a number of parties, including HQUS, during the RFP approval process before the Department. HQUS, concerned that it could be required to deliver the historical amount of generation into New England outside of the contract, sought a modification to the definition of “Incremental Hydroelectric Generation” to simply refer to generation that is *capable* of delivering a net increase in hydropower deliveries into New England. This proposed modification was opposed by several commenters. The Department stated:

The Department agrees that there would be a risk to ratepayers if an electric distribution company entered into a contract with a bidder based on a bidder’s capability to provide a net increase in MWh/year of hydroelectric generation. If the bidder subsequently failed to provide a net increase in generation, ratepayers would have paid for a service (i.e., Incremental Hydroelectric Generation) that the bidder did not deliver.<sup>96</sup>

On the other side of the argument, a commenter argued that the RFP definition be modified so that the proposed deliveries must be in addition to historical deliveries without any exceptions. The Department rejected this proposed modification as well.<sup>97</sup>

The IE noted that while there was a fairness issue because a contractual requirement for deliveries outside of the proposed contract was not clearly stated either in the RFP or form PPA, the IE also noted that whether proposed imports would in fact be incremental to other deliveries HQUS would make was a matter of concern to the Department. The IE recommended that the Department’s decision with respect to this matter be raised with HQUS in the negotiations. Under the totality of the circumstances, the IE advised that it was acceptable for National Grid to negotiate to obtain a contractual commitment from HQUS on this matter, but cautioned that it be pursued in a manner that would not cause a collapse of the negotiations.

Another key issue in the negotiations involved the termination payments for which HQUS would be responsible for in the event that CMP defaulted on its obligations under the TSA (non-excused transmission outages) resulting in a contract termination by the EDCs. [REDACTED]

[REDACTED]

[REDACTED]

[REDACTED]

[REDACTED] The IE advised that it was appropriate for the EDCs to seek to negotiate full cover damages in this circumstance, but it was not a requirement of the RFP.

The RFP clearly states that for firm hydro proposals, the seller will be responsible for liquidated damages for failure to deliver (RFP section 2.2.1.3.i) and where transmission is part of a packaged bid, the bidder will be responsible for both liquidated damages for the energy and liquidated damages for associated

<sup>96</sup> D.P.U. 17-32, at 33.

<sup>97</sup> *Id.* at 31-33.

transmission support costs (RFP section 2.2.1.3.iv). However, “liquidated damages” is not further defined in the RFP (although “cover damages” was defined in the form PPA as the remedy for seller unexcused failure to deliver). When several commenters had asked the Department to modify the RFP to more clearly define “liquidated damages,” the Department declined to do so and stated that “we expect parties to address the particulars of any liquidated damages provisions during the course of contract negotiations.”<sup>98</sup>

[REDACTED]

[REDACTED] Overall, however, each of the three EDCs were able to negotiate risk allocation provisions, including seller damage provisions, that were significantly better from an EDC/EDC customer standpoint than those included in the NECEC/HRE bids.<sup>99</sup>

Another issue was how to address what HQUS’ contractual obligations should be with respect to the CES, which was not promulgated until after HRE’s bid was submitted. The parties agreed to seek an interpretive ruling from DEP to obtain confirmation that its proposed manner of complying with the CES was appropriate (or be notified of any other applicable requirements or guidelines), with the right of either party to terminate if the interpretive ruling was unsatisfactory to it. Absent a termination, HQUS would be obligated to comply with the CES, and it would be obligated to use commercially reasonable efforts to comply with the CES if there was a change in law. This result seemed fair under the circumstances that the CES rules were not in effect at the time of bid submittal and the form PPA did not address CES rule compliance.

Finally, toward the end of the negotiations, [REDACTED]

[REDACTED]

<sup>98</sup> *Id.* at 45.

<sup>99</sup> In its RFP design report (p.25), the IE expressed concerns that the RFP allowed bidders to seek to recover abandoned plant costs at FERC if they failed to obtain required permits. In its bid, NECEC [REDACTED]. In the contract as executed, abandoned plant cost recovery is allowed only where abandonment of the project is caused by a change in Massachusetts law, with a cap on the EDCs’ potential liability, and only after non-appealable FERC and Department regulatory authorizations for the proposed project has been obtained.

<sup>100</sup> [REDACTED]

All in all, the IE found that the contracts that resulted from the negotiation process were no less adverse to the EDCs than the proposals and associated contracts submitted by HRE and CMP and, in many cases, were more favorable to the EDCs and their customers. This satisfied the criterion that the resulting contracts were consistent with, or at least no less favorable, than the proposals that were evaluated by the Evaluation Team.<sup>101</sup>

Neither CMP nor HQUS are affiliates of any of the EDCs. Hence, there was no issue of any undue preference given to affiliates in the negotiations. Nor was any such undue preference provided to HQUS or CMP.

The IE also monitored the negotiations and reviewed the contracts with respect to whether the contracts or any provision thereof violated any threshold requirement of the RFP. Neither the HQUS PPA nor the CMP TSA violate any RFP threshold requirement, in the IE's opinion.

All in all, the EDCs fairly negotiated the terms of the HQUS PPA and CMP PPA consistent with the requirements of the RFP.

## VI. Conclusions

In this report, Peregrine, the Independent Evaluator for the 83D solicitation, has summarized and analyzed the entire solicitation, bid evaluation, selection and contract negotiation process which resulted in the execution, and filing for Department approval, of a power purchase agreement between the EDCs and HQUS and an accompanying transmission service agreement between the EDCs and Central Maine Power Company. These agreements are the result of a competitive bidding process for approximately 9,450,000 of annual MWh of Clean Energy Generation resources, as defined in 83D and the RFP previously approved for issuance by the Department. The Independent Evaluator has been closely involved in the entire solicitation process and has had access to all information and data related to the competitive solicitation and bid selection process necessary for the IE to perform its monitoring, oversight, and reporting functions, as more fully described in this report. It is the IE's conclusion that, in the phraseology of 83D, that "all bids were evaluated in a fair and non-discriminatory manner" and that the New England Clean Energy Connect 100% hydro bid, with energy supplied solely from Hydro Quebec hydroelectric generation resources, was fairly selected as the winning bid (after a proposal from

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<sup>101</sup> As part of the NECEC proposal, CMP proposed to contribute funding of \$50 million in total over a 40-year period following commercial operation of the NECEC project to provide benefits to low-income Massachusetts electricity customers (\$700,000 in Years 1-20 and \$1.1 million per year thereafter) and to promote innovative investments in customer-facing energy technologies targeting low-income Massachusetts households, such as applied energy storage technology (\$300,000 in Years 1-20 and \$400,000 per year thereafter). To effectuate this commitment, CMP has entered into a Memorandum of Understanding with Action, Inc. and Action for Boston Community Development, Inc. (collectively, "The Low Income Energy Affordability Network" or "LEAN") ("CMP/LEAN MOU"). The CMP/LEAN MOU is consistent with CMP's representations in the NECEC bid, based on the IE's review.

Northern Pass had been conditionally selected but whose conditional selection was terminated due to a denial of siting approval for the proposed Northern Pass transmission line). The NECEC 100% hydro bid was the highest ranking bid in the final evaluation of project portfolios (with quantities that approximated the 9,450,000 annual MWh procurement target) as well as the proposal with the highest net benefits and lowest cost per MWh in real levelized \$2017.

DOER, with the concurrence of the EDCs, requested that Peregrine also monitor the contract negotiations between the EDCs and the selected bidders, and Peregrine performed this function and has reported on its monitoring in this report.<sup>102</sup> It is Peregrine's assessment that overall the EDCs fairly negotiated the contracts that have been submitted for the Department's approval, that the negotiated terms are at least as favorable as those included in HQUS' and CMP's winning proposals (as they were modified in the bidding process) for the NECEC 100% hydro bid, and that the resulting contracts satisfy the requirements of the 83D RFP. Moreover, the IE notes that the EDCs were able to negotiate improvements in certain risk allocation features in the PPA and TSA from HQUS' and CMP's proposals, thereby improving on them from the standpoint of the EDCs and their distribution customers.

Finally, as described in this report,<sup>103</sup> the solicitation was implemented in a manner that appropriately addressed or rendered moot the concerns the IE had noted in its RFP Design Report regarding interconnection requirements, the application of change in law provisions, and abandonment cost recovery for transmission projects.

<sup>102</sup> This monitoring started when negotiations were expected to be exclusively with Northern Pass, an Eversource affiliate, and HRE, but continued throughout the time that negotiations were with NECEC and HRE/HQUS, non-affiliates of the EDCs.

<sup>103</sup> See Section II.B at p. 6 (IE suggested modifications in RFP Design Report), Section III.C.2.a at p. 24 (abandonment cost liability), Section V.B.1 at pp.41-43 (interconnection-related requirements), Section V.B.2 at p. 47 (change in law), and Section V.D at p. 53, n. 99 (abandonment cost liability) .



## Appendix A - Qualifications and relevant experience of the Peregrine independent evaluator team

The Independent Evaluator for the 83D RFP consists of Peregrine Energy Group, Inc. (“Peregrine”) as the contracting party to the Massachusetts Department of Energy Resources (“DOER”), with four subcontractors--New Energy Opportunities, Inc. (“NEO”), Merrimack Energy Group, Inc. (“Merrimack”), Power Consulting Services, LLC, and Meaden & Moore, LLP (Meaden & Moore). The key individuals for the project team are:

- Paul Gromer, CEO of Peregrine
- Barry Sheingold, President of NEO
- Wayne Oliver, President of Merrimack
- David Andrus, Principal of Power Consulting Services, LLC
- Patrick Kelleher, Partner, Investigative Accounting Group, Meaden & Moore

Overall, Paul Gromer is responsible for management of the Independent Evaluator team, with Barry Sheingold serving as project lead for the 83D solicitation, Wayne Oliver as co-lead, David Andrus as transmission consultant, and Patrick Kelleher advising on affiliate relationships.

Mr. Gromer, CEO of Peregrine, is an attorney and former Massachusetts Commissioner of Energy Resources. He has led Peregrine in providing consulting and related services in the renewable energy, energy efficiency, and competitive retail energy fields over the past 25 years.

Barry Sheingold and Wayne Oliver have collaborated as IEs or consultants on a more than a dozen clean and alternative energy solicitations for long-term contracts, including:

- Southern California Edison Renewable Portfolio Standard solicitations for long-term contracts—4 solicitations (2009, 2013, 2014, 2015);
- NV Energy Emission Reduction and Capacity Replacement Renewable Energy RFPs—3 solicitations (2014, 2015 and 2016);
- Southern California Edison Company Request for Offers for Combined Heat and Power—3 solicitations (2012, 2013, 2014);
- PacifiCorp Request for Proposals for Renewable Electric Resources (2008);
- Delmarva Power solicitation for long-term contracts (2006).

In addition, NEO and Merrimack Energy have advised Massachusetts state agencies relating to the development and implementation of competitive procurement processes for long-term contracts to facilitate financing of renewable energy projects.

- Massachusetts Utilities Long-Term Contracting Requirements for Renewable Resources under Section 83 of the Green Communities Act (2009-2010);
- Massachusetts Technology Collaborative RFP for Options Agreements on Renewable Energy Certificates (2003-05).

Over the past 18 years, Mr. Sheingold has served as IE or provided consulting assistance in the clean energy field, with a specialty in power procurement. Mr. Sheingold served as DOER's principal consultant with respect to DOER's role in the design and implementation of two prior RFPs for long-term renewable energy contracts under Section 83A of the Green Communities Act ("GCA") and was the project lead on a study prepared on behalf of DOER for the Massachusetts legislature on the long-term contracting solicitation processes under Section 83 of the GCA. He has advised the New York State Energy Research and Development Authority regarding various rounds of its long-term contracting program for renewable energy attributes and related procurement matters. Mr. Sheingold has also performed an independent evaluator function for renewable energy RFPs in Oklahoma and Hawaii. He has submitted testimony or other assessments on a variety of renewable energy projects and utility procurement-related matters in a number of states and provinces. Mr. Sheingold has a broad electric industry background. Prior to founding NEO, Mr. Sheingold served in a business or legal role for an electric utility company, a power marketer, a power plant developer, and the Federal Energy Regulatory Commission.

Wayne Oliver, President of Merrimack, has served as IE or similar role on over 100 competitive procurement assignments dating back to 1989. His experience in this role has included RFPs for renewable resources, conventional generation options, energy storage projects and demand response and demand-side management resources. Mr. Oliver has reviewed and evaluated thousands of power supply proposals covering all types of technologies, fuel types, and financing and contractual structures.

Dave Andrus is a Vermont-based transmission consultant with over 30 years' experience. Mr. Andrus previously led a national transmission planning and analysis practice that provided consulting services in the areas of asset valuation, condition assessment, due diligence and owners engineer reviews, renewable energy integration analyses, interconnection/delivery/congestion studies, and market rules evaluations.

Patrick Kelleher is a partner in Meaden & Moore's Investigative Accounting Group and is in the firm's Boston office. The Investigative Accounting Group provides insurance services, forensic accounting, fraud evaluations examination assessment, measurement of economic damage and litigation support services among other things. As part of its responsibilities, the Investigative Accounting Group conducts forensic affiliate investigations between different business organization entities.

## Appendix B - Key provisions of the 83D RFP

| RFP Characteristics/<br>RFP Section | Summary/Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Eligible Bid<br>Categories          | <p>There are four eligible bid categories:</p> <ol style="list-style-type: none"> <li>3. Proposal to sell Incremental Hydroelectric Generation (including environmental attributes) on a firm basis pursuant to a PPA;</li> <li>4. Proposal to sell new Class I RPS eligible resources (energy and RECs or RECs only) pursuant to a PPA;</li> <li>5. Proposal to sell new Class I RPS eligible resources firmed by Incremental Hydro Generation on a firm basis pursuant to a PPA;</li> <li>6. Any of the foregoing types of PPA proposals packaged with a proposed transmission project with payments to be made under a FERC tariff and service agreement.</li> </ol> |
| Section 2.2.1.3                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Contract term                       | The contract term is prescribed by statute—15 to 20 years.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Section 2.2.1.6                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| Minimum Contract<br>Size            | 20 MW.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
| Section 2.2.1.7                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

|                                                                                                  |                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Capacity,<br>Interconnection<br>and Delivery<br>Requirements<br><br>Sections 2.2.1.8;<br>2.2.1.9 | <p>The Distribution Companies will not purchase capacity under long-term contracts.</p> <p>However, a proposal must describe the amount of capacity, and the capacity commitment period, for which the bidder expects the generation unit(s) in their proposal to qualify under the Forward Capacity Auction Qualification Requirements under the ISO-NE market rules.</p> |
|--------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Each project must include a commitment to interconnect to an ISO New England Pool Transmission Facility ("PTF") at the Capacity Capability Interconnection Standard. Bidders must demonstrate that the proposed point of delivery into ISO-NE, along with the proposed interconnection and transmission upgrades, is sufficient to ensure full dispatch of the proposal's Clean Energy Generation profile.

|                              |                                                                                                                                                                                                                                                            |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Bid fees<br><br>Section 1.10 | <p>The minimum bid fee is \$7,500 for a 20 MW bid, increased by \$375/MW to a maximum bid fee of \$100,000. For each price offer (above one), the bid fee will increase \$10,000 for projects of less than 100 MW in size and \$25,000 for all others.</p> |
|------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

|                                                   |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Allowable Pricing:<br>PPAs<br><br>Section 2.2.1.4 | <p>Proposals to sell Clean Energy Generation and associated environmental attributes from Firm Service Hydroelectric Generation must be priced either (i) on a \$/MWh basis or (ii) indexed at or below the ISO-NE Locational Marginal Price at a defined pricing node on the PTF.</p> <p>Proposals to sell Clean Energy Generation and/or associated RECs from New Class I RPS eligible resources must be priced (i) on a \$/MWh basis or (ii) indexed at or below the ISO-NE Locational Marginal Price at a defined pricing node on the PTF. Separate pricing must be provided for energy and RECs. If the RECs cease to conform with RPS Class I eligibility criteria, the Distribution Companies may thereafter only pay for energy under the PPA. Pricing for Clean Energy Generation and RECs must closely align with the relative market value of these products.</p> <p>Alternative bids will be considered in which the Distribution Companies would obtain entitlements to RECs/environmental attributes from a Clean Energy Generation project for the life of the project, with payments to be made over the term of the long-term contract (15-20 years).</p> |
|---------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|

Winter Months Energy Delivery Guarantee      Class I RPS eligible resources will be required to guarantee 70% of the energy in their delivery profile during the Winter Peak Period (7 am-11 pm, weekdays, excluding holidays, during the months of December through February).

Section 2.2.2.7      Firm Service Hydroelectric generation proposals will be required to submit a delivery profile with no Winter Peak Period hour less than 60% of the highest single hourly delivery proposed by the bidder, with delivery guaranteed during each hour in the Winter Peak Period.

Bidders not satisfying the guarantee will be responsible for liquidated damages for energy and associated RECs and environmental attributes not delivered, and as applicable, associated transmission infrastructure support costs.

Requirements applicable to transmission proposals      Pricing for a transmission project should be proposed separately under a FERC-filed tariff.

Sections 2.2.1.4.ii, 2.2.2.6, 2.2.2.6.1, 2.2.2.6.2, and 2.2.2.6.3      Fixed prices are encouraged; cost of service pricing is allowed, but must include significant cost containment features. Bids that eliminate or limit customer risk to a greater degree will be evaluated more favorably. Cost containment features (protecting ratepayers from cost overruns) may include caps on project construction and capital costs, costs of related system upgrades, interconnection costs, and operations and maintenance costs.

If a transmission project accepted under this RFP is cancelled or abandoned, or its development is otherwise discontinued, the bidder shall be allowed to propose to recover prudently-incurred project-related costs ("abandonment costs") from the Distribution Companies in accordance with FERC rules and policies except that in no event may a bidder recover abandonment costs if the abandonment was caused directly or indirectly by some act or failure to act of the bidder.

The evaluation process will value more favorably proposals to the extent that the proposals eliminate or minimize ratepayer exposure to abandonment cost risk by not seeking abandonment cost recovery or including significant limitations, such as a proposal agreeing not to seek recovery for abandonment costs incurred prior to the issuance of this RFP, or a date certain to be proposed by the bidder.

In the event that generation as part of a packaged bid with transmission does not show up in accordance with a bidder's baseline schedule, transmission



payments will be reduced in proportion to the shortfall. The Evaluation Team will consider other mechanisms as proposed by the bidder to mitigate ratepayer risk. The evaluation process will evaluate more favorably proposals that include mechanisms to protect ratepayers from risks associated with payment for transmission costs when any associated expected Clean Energy Generation, as proposed by the bidder, is absent, reduced, or curtailed as compared to the baseline schedule.

Other threshold requirements

Sections 2.2.2 through 2.2.13

Bidders with generation proposals must demonstrate control over the site (which may be by option rights) for the generation project, including rights necessary to access the site. Bidders with transmission proposals must demonstrate a reasonable and achievable plan for obtaining site control for the transmission project.

Bidders must demonstrate the technical and financial viability of their proposed projects.

Bidders must demonstrate that they have sufficient relevant experience and expertise to successfully develop, finance, construct and operate the proposed project.

Bidders must show that the proposed project will “provide enhanced electricity reliability within the commonwealth,” as required by 83D.

Bidders must demonstrate that they can develop, finance, and construct their proposed project within a commercially reasonable timeframe.

Bidders must demonstrate that they will utilize an appropriate tracking system to account for the delivery of clean energy.

Bidders must demonstrate that a long-term contract will facilitate the financing of their proposed project. The bidder may specify how a long-term contract would permit it to finance a proposal that would otherwise not be financeable or assist it in financing of its proposal.

Security

Section 2.2.2.11

For RPS Class I Renewable Generation Units, the required level of contract security is \$20,000 multiplied by the maximum allowable energy delivery in MWh per hour (\$2 million for 100 MW), with 50% due on contract execution and the remaining 50% due after regulatory approval.

For hydroelectric generation, the required security is similar, except additional security may be required after regulatory approval is received based on market exposure.

The required level of security for transmission projects is \$10,000 per MW, with 50% due on selection and 50% due upon FERC acceptance of the rate schedule or tariff and service agreement.

Proposal  
evaluation—Stage  
Two

Section 2.3

Proposals that meet threshold requirements (Stage One evaluation) will be subject to a quantitative and qualitative evaluation in Stage Two. Stage Two scoring will be based on a 100-point scale, with 75 points for quantitative factors and 25 points for qualitative factors. The product of the analysis will be a relative ranking and scoring of proposals.

Quantitative  
Evaluation

Section 2.3.1

The Evaluation Team may conduct an initial screening and may determine (by consensus) that one or more proposals are not economically competitive. Proposals that proceed to the quantitative evaluation will be evaluated on their direct and indirect economic and environmental costs and benefits based on a combination of their direct contract price cost and benefits and other costs and benefits to retail customers where applicable.

Direct costs are the costs to be paid by the Distribution Companies for generation and/or transmission (including upgrade costs associated with transmission). Direct benefits will include the projected revenues from the sale of energy and RECs based on forecasted market prices and any revenue from sales of excess transmission capacity, if applicable.

Other benefits and costs may include but not be limited to:

- The impacts of changes in LMP paid by customers in the Commonwealth and/or impact on production costs;
- The environmental attributes of generation from incremental hydroelectric generation and new Class I RPS eligible resources using an economic proxy value for contribution to GWSA requirements, and any additional impacts on the overall ability to meet GWSA requirements;
- Economic impacts associated with resource firmness; and
- Indirect impacts, if any, for retail customers on the capacity or ancillary services markets with the proposed project in service.

The evaluation process will include an evaluation of benefits using the outputs from an electric market simulation model. For purposes of computing net present value, a discount factor consisting of the weighted average value of the Distribution Companies' cost of capital will be used.

Qualitative  
Evaluation

The qualitative evaluation will consist of factors mandated by 83D as well as other factors considered important by the Evaluation Team. These include:

Section 2.3.2

- Project viability;
- Extent to which the project can support the Commonwealth's GWSA requirements by delivering Clean Energy Generation and/or RECs or environmental attributes on or before December 31, 2020;
- Siting and permitting;
- Reliability benefits;
- Price risk/price firmness;
- Environmental impacts from siting;
- Economic benefits to the Commonwealth;
- Extent to which proposals combine new Class I renewable resources and firm hydroelectric generation and demonstrate a benefit to low-income ratepayers in the Commonwealth without adding cost to the project.

Following the State Two Evaluation, the Evaluation Team will determine which proposals proceed to the Stage Three evaluation based on the following considerations: (1) the rank order of the proposals at the end of the Stage Two evaluation; (2) the cost effectiveness of the proposals based on the Stage Two quantitative evaluation; and (3) the total annual MWh/year quantities of the proposal(s), relative to the annual procurement target.

Stage Three  
Evaluation

In Stage Three the Evaluation Team will evaluate the remaining proposals based on the Stage Two evaluation criteria and, at their discretion, the following additional factors:

Section 2.4

Portfolio effect:

- Overall impact of various portfolios of proposals on the Commonwealth's policy goals, as directed by the DOER, including GWSA goals
- Overall cost effectiveness of various portfolios of proposals

### Risks associated with project viability of the proposals

Any risks to customers that may be associated with projects proposing to recover transmission costs through transmission rates not fully captured in the Stage Two evaluation

Any benefits to customers that may not have been fully captured in the Stage Two evaluation

Any other considerations, as appropriate, to ensure selection of the proposal(s) which provide the greatest impact and value consistent with the stated objectives and requirements of Section 83D, as set forth in this RFP.

Under Section 83D, if the Distribution Companies are unable to agree on the selection of proposals among themselves, then the DOER, in consultation with the Independent Evaluator, shall make the final binding determination of the winning bid(s).

Contracting Process;  
Regulatory  
Approvals

Sections 2.5, 2.6

The Distribution Companies will negotiate to contract with selected bidder(s) based on their load ratio share. With regard to any transmission tariff or contract, allocation of rights and obligations will also be based on the Distribution Companies' load ratio share.

The Distribution Companies intend to submit any long-term contract for Department regulatory approval within 45 days of executing a long-term contract; Department regulatory approval is required for the contract to become effective. Any FERC-jurisdictional rate schedule or tariff and service agreement agreed upon by the Distribution Companies will be filed with FERC under Section 205 of the Federal Power Act, which must be accepted by FERC before becoming effective.

RFP Schedule

Section 3.1

The proposed schedule covers a 13-month period, with the following anticipated dates (which are subject to change):

- Issue RFP – 3/31/2017
- Bidders conference – 4/14/2017
- Submit notice of intent to bid—4/21/2017
- Deadline for bidder submission of questions—4/21/2017
- Proposals Due – 7/27/2017
- Selection of projects for negotiation – 1/25/2018

- Finalize contract negotiations – 3/27/2018
- Submit contracts for Department approval – 4/25/2018

Role of the  
Independent  
Evaluator

The role of the Independent Evaluator is described in Section 1.5 of the proposed RFP.

Section 1.5

Bidder Certification

Section 1.8

Each bidder is required to certify, with submission of its proposal, that, *inter alia*, it has no knowledge of confidential information associated with development of this RFP and, except as disclosed in relevant portions of its response, the bidder is not an affiliate of any Distribution Company and no Distribution Company has a financial or other affiliate interest in the bidder or the bidder's proposed project.

Information  
Required of Bidders

Appendix B

The RFP contains a Bidder Response Package (Appendix B) which contains information requests for bidders; each bidder was required to provide its responses to the Appendix B questions as part of its proposal. Appendix B was been provided with the proposed RFP; a Certification, Project and Pricing data form (Excel format), in which bidders are required to provide proposed pricing and forecasted generation is described but not included in Appendix B and was posted on the RFP website.

Forms of  
Agreements

Appendix C;  
Appendix B,  
Section 15.

Forms of PPAs for the three types of generation proposals were posted on the RFP website following Department approval of the issuance of the RFP. Also posted was a document summarizing provisions to be included by bidders for proposed transmission service agreements.

PPA bidders were required to state any exceptions and include specific alternative language to the applicable form PPAs.

Transmission bids were required to contain a proposed transmission agreement and contain a summary of material provisions.

Utility Standard of  
Conduct

Eversource and National Grid posted standards of conduct on the RFP website. Generally, they provide for separation, and prohibit communication between, an



## Appendix G

Evaluation Team and a Bid Team, with respect to the RFP and solicitation process.

[illegible]

| APPENDIX D                                                 |                |           |                                  |                    |                    |               |            |                                          |                     |                       |                    |                 |              |             |             |
|------------------------------------------------------------|----------------|-----------|----------------------------------|--------------------|--------------------|---------------|------------|------------------------------------------|---------------------|-----------------------|--------------------|-----------------|--------------|-------------|-------------|
| LARGE PROJECTS: STAGE 2 EVALUATION                         |                |           |                                  |                    |                    |               |            |                                          |                     |                       |                    |                 |              |             |             |
|                                                            |                |           |                                  |                    |                    |               |            |                                          |                     |                       |                    |                 |              |             |             |
| Bid No.                                                    | Project        | Bidder(s) | Max.<br>Contract<br>Amt.<br>(MW) | Proposal Type      | Generator Location | Delivery Zone | Start Date | Proposal Cost (PPA + GW/h/year Transm.)* | Net Direct Benefit* | Net Indirect Benefit* | Net Total Benefit* | Net NPV's (000) | Quant. Score | Qual. Score | Total Score |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$23.23             | \$23.24               | \$46.47            | \$2,049,673     | 75.00        | 10.94       | 85.94       |
|                                                            | 40 NECEC Hydro | HRE/CMP   |                                  | 1090 Hydro/transm. | Quebec             | ME            | 12/31/2022 | \$59.34                                  | \$22.26             | \$19.92               | \$42.18            | \$1,664,569     | 68.08        | 12.16       | 80.24       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$15.41             | \$24.32               | \$39.73            | \$3,875,670     | 64.12        | 15.63       | 79.75       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$10.31             | \$25.87               | \$36.18            | \$3,890,386     | 58.38        | 18.25       | 76.63       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$9.63              | \$26.08               | \$35.71            | \$3,284,303     | 57.62        | 18.13       | 75.75       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$8.97              | \$26.08               | \$35.05            | \$3,223,570     | 56.56        | 19.13       | 75.69       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$15.40             | \$21.07               | \$36.47            | \$3,557,166     | 58.86        | 15.68       | 74.54       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$9.63              | \$23.99               | \$33.62            | \$3,606,849     | 54.25        | 16.98       | 71.23       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$8.55              | \$22.72               | \$31.27            | \$2,876,789     | 50.47        | 18.14       | 68.61       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$7.89              | \$22.72               | \$30.61            | \$2,816,055     | 49.41        | 19.14       | 68.55       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$10.27             | \$23.24               | \$33.51            | \$1,477,913     | 54.08        | 9.85        | 63.93       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$16.21             | \$12.59               | \$28.80            | \$564,722       | 46.47        | 12.16       | 58.63       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$3.06              | \$22.46               | \$25.52            | \$1,508,211     | 41.19        | 9.31        | 50.50       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$16.76             | \$5.83                | \$22.59            | \$519,171       | 36.46        | 13.69       | 50.15       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$15.62             | (\$6.86)              | \$8.76             | \$253,627       | 14.14        | 12.79       | 26.93       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | \$12.64             | (\$5.52)              | \$7.12             | \$206,097       | 11.49        | 14.04       | 25.53       |
|                                                            |                |           |                                  |                    |                    |               |            |                                          | (\$7.30)            | \$15.77               | \$8.47             | \$238,200       | 13.67        | 9.75        | 23.42       |
| * Costs and Net Benefits are in 2017 Real \$/MWh Levelized |                |           |                                  |                    |                    |               |            |                                          |                     |                       |                    |                 |              |             |             |
|                                                            |                |           |                                  |                    |                    |               |            |                                          |                     |                       |                    |                 |              |             |             |

| APPENDIX E                                                 |            |            |                         |            |            |            |               |            |                  |            |                         |              |             |             |         |
|------------------------------------------------------------|------------|------------|-------------------------|------------|------------|------------|---------------|------------|------------------|------------|-------------------------|--------------|-------------|-------------|---------|
| SMALL PROJECTS: STAGE 2 EVALUATION                         |            |            |                         |            |            |            |               |            |                  |            |                         |              |             |             |         |
| Bid No.                                                    | Project    | Bidder(s)  | Max. Contract Amt. (MW) | Technology | Generator  |            | Delivery Zone | Start Date | Proposal Cost    |            | Net Benefit NPV\$ (000) | Quant. Score | Qual. Score | Total Score |         |
|                                                            |            |            |                         |            | Location   | Zone       |               |            | (PPA + Transm.)* | year       |                         |              |             |             | GW/h    |
| 1                                                          | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | \$27.89                 | \$93,359     | 75.00       | 12.25       | 87.25   |
| 2                                                          | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | \$21.71                 | \$253,650    | 58.38       | 11.00       | 69.38   |
| 3                                                          | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | \$17.33                 | \$119,890    | 46.60       | 18.75       | 65.35   |
| 4                                                          | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | \$13.71                 | \$107,547    | 36.87       | 10.00       | 46.87   |
| 5                                                          | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | \$12.98                 | \$8,057      | 34.92       | 10.00       | 44.92   |
| 6                                                          | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | \$9.86                  | \$760,807    | 26.51       | 12.13       | 38.64   |
| 7                                                          | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | \$10.34                 | \$141,781    | 27.81       | 10.00       | 37.81   |
| 8                                                          | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | \$10.52                 | \$91,957     | 28.29       | 9.25        | 37.54   |
| 9                                                          | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | \$9.11                  | \$35,761     | 24.51       | 10.00       | 34.51   |
| 10                                                         | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | \$7.25                  | \$52,054     | 19.49       | 10.00       | 29.49   |
| 11                                                         | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | \$5.85                  | \$20,603     | 15.72       | 10.00       | 25.72   |
| 12                                                         | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | \$2.14                  | (\$8,189)    | 5.76        | 10.50       | 16.26   |
| 13                                                         | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | \$1.08                  | \$21,284     | 2.91        | 10.00       | 12.91   |
| 14                                                         | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | (\$0.26)                | \$22,471     | -0.70       | 10.50       | 9.80    |
| 15                                                         | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | (\$0.86)                | \$625,904    | -2.32       | 10.25       | 7.93    |
| 16                                                         | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | (\$7.79)                | \$27,371     | -20.96      | 10.00       | -10.96  |
| 17                                                         | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | (\$18.67)               | \$169,744    | -50.22      | 10.00       | -40.22  |
| 18                                                         | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | (\$31.97)               | \$227,793    | -85.99      | 7.31        | -78.68  |
| 19                                                         | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | (\$36.68)               | (\$5,768)    | -98.65      | 10.00       | -88.65  |
| 20                                                         | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | (\$37.99)               | (\$51,283)   | -102.17     | 0.00        | -102.17 |
| 21                                                         | ██████████ | ██████████ | ██████████              | ██████████ | ██████████ | ██████████ | ██████████    | ██████████ | ██████████       | ██████████ | (\$48.28)               | (\$574,031)  | -129.85     | 10.50       | -119.35 |
| * Costs and Net Benefits are in 2017 Real \$/MWh Levelized |            |            |                         |            |            |            |               |            |                  |            |                         |              |             |             |         |

## APPENDIX F: STAGE 3 PORTFOLIO SUMMARY

[illegible]



**REDACTED**

| APPENDIX G: STAGE 3 PORTFOLIO SUMMARY--SCORING BASED ON ALTERNATIVE \$NPV QUANTITATIVE EVALUATION METRIC AS REPORTED BY DOER                                                                      |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------|---------------------------|------------|-------------------|-------------|------------|---------------|----------------------|------------------------|--------------------------|-----------------------|----------------------------|-----------------|----------------|----------------|
| Proposal/Portfolio                                                                                                                                                                                | Portfolio Number/<br>Description | Capacity--MW<br>Installed | Technology | Delivery Location | ISO-NE Zone | Start Date | PPA + Transm. | Annual Energy<br>GWh | Net Direct<br>Benefit* | Net Indirect<br>Benefit* | Net Total<br>Benefit* | Net Benefit<br>NPV \$(000) | Quant.<br>Score | Qual.<br>Score | Total<br>Score |
| NECEC Hydro***<br>NECEC Hydro Delay                                                                                                                                                               |                                  |                           |            |                   |             |            |               |                      | \$10.85                | \$25.87                  | \$36.72               | \$3,948,938                | 75.87           | 18.25          | 94.12          |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      | \$9.74                 | \$25.87                  | \$35.61               | \$3,829,761                | 73.58           | 18.25          | 91.83          |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      | \$14.24                | \$24.89                  | \$39.13               | \$4,003,083                | 76.91           | 18.00          | 94.91          |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      | \$13.16                | \$24.89                  | \$38.05               | \$3,892,476                | 74.78           | 18.00          | 92.78          |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      | \$10.29                | \$25.87                  | \$36.16               | \$3,888,747                | 74.71           | 18.25          | 92.96          |
|                                                                                                                                                                                                   | Portfolio 6                      | 1090                      | Hydro      | ME                |             | 12/31/2022 | \$59.05       | 9,555                | \$15.70                | \$24.32                  | \$40.02               | \$3,903,685                | 75.00           | 15.63          | 90.63          |
|                                                                                                                                                                                                   | Portfolio 6 Sensitivity          | 1090                      | Hydro      | ME                |             | 12/31/2023 | \$57.90       | 9,555                | \$18.65                | \$22.81                  | \$41.46               | \$3,854,921                | 74.06           | 15.63          | 89.69          |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   | Portfolio 3                      |                           |            |                   |             |            |               |                      | \$15.59                | \$21.89                  | \$37.48               | \$3,900,618                | 74.94           | 15.39          | 90.33          |
|                                                                                                                                                                                                   | Portfolio 12                     |                           |            |                   |             |            |               |                      | \$15.96                | \$22.47                  | \$38.43               | \$3,879,300                | 74.53           | 15.50          | 90.03          |
|                                                                                                                                                                                                   | Portfolio 7                      |                           |            |                   |             |            |               |                      | \$15.69                | \$21.07                  | \$36.76               | \$3,585,182                | 68.88           | 15.68          | 84.56          |
|                                                                                                                                                                                                   | Portfolio 14                     |                           |            |                   |             |            |               |                      | \$9.32                 | \$25.16                  | \$34.48               | \$3,314,317                | 63.68           | 18.87          | 82.55          |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   | Portfolio 5                      |                           |            |                   |             |            |               |                      | \$9.30                 | \$23.32                  | \$32.62               | \$3,255,600                | 62.55           | 18.55          | 81.10          |
|                                                                                                                                                                                                   | Portfolio 9                      |                           |            |                   |             |            |               |                      | \$8.97                 | \$26.08                  | \$35.05               | \$3,223,570                | 61.93           | 19.13          | 81.06          |
|                                                                                                                                                                                                   | Portfolio 10                     |                           |            |                   |             |            |               |                      | \$7.89                 | \$22.72                  | \$30.61               | \$2,816,055                | 54.10           | 19.14          | 73.24          |
|                                                                                                                                                                                                   | Portfolio 13                     |                           |            |                   |             |            |               |                      | \$20.24                | \$4.62                   | \$24.86               | \$2,733,562                | 52.52           | 11.85          | 64.37          |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   | Portfolio 4                      |                           |            |                   |             |            |               |                      | \$17.96                | \$11.33                  | \$29.29               | \$2,616,587                | 50.27           | 11.45          | 61.72          |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   | Portfolio 2                      |                           |            |                   |             |            |               |                      | \$15.70                | \$9.91                   | \$25.61               | \$2,550,522                | 49.00           | 11.30          | 60.30          |
| * Real Levelized 2017\$/MWh                                                                                                                                                                       |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
|                                                                                                                                                                                                   |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
| *** NECEC Hydro                                                                                                                                                                                   | Escalating Transmission Rate     | 1090                      | Hydro      | ME                |             | 12/31/2022 | \$58.92       | 9,555                | \$15.83                | \$24.32                  | \$40.15               | \$3,916,299                |                 |                |                |
| *** NECEC Hydro                                                                                                                                                                                   | HQ Deliveries of 110 MW          | 1200                      | Hydro      | ME                |             | 12/31/2022 | \$58.92       | 9,555                | \$15.42                | \$26.37                  | \$41.79               | \$4,076,609                |                 |                |                |
| *** These evaluations were conducted after selection                                                                                                                                              |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
| Escalation Transmission Rate: TCR discovered and corrected an error on CMP's escalating transmission rate proposal; this is the proposal reflected in the executed Transmission Service Agreement |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |
| HQ Deliveries of 110 MW: Assumed that HQUS would deliver 110 MW on a baseload basis using its rights on the NECEC transmission line                                                               |                                  |                           |            |                   |             |            |               |                      |                        |                          |                       |                            |                 |                |                |



Exhibit CMP-1.1.1-B

Analysis of Undergrounding the 54 Mile Corridor

|                                                  |             |
|--------------------------------------------------|-------------|
| Incremental Capital Cost                         | 644,563,669 |
| Incremental Capital Cost (With AFUDC)            | 767,911,230 |
| Increase in Transmission Rate (\$/KW-Month)      | 6.50        |
| Net Present Value (2017 \$s) of Revenue          | 600,980,175 |
| Levelized Revenue (2017 \$s)                     | 85,020,000  |
| Annual Energy (MWhs)                             | 9,450,000   |
| Real Levelized \$/MWh (2107 \$s)                 | 9.00        |
| Net Total Benefit - Independent Evaluator Report | 40.02       |
| Net Total Benefit With 54 Miles of Underground   | 31.02       |
| Net Total Benefit - Rank 8                       | 32.62       |
| Net Total Benefit - Rank 9                       | 30.61       |



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED REBUTTAL TESTIMONY OF  
GERRY J. MIRABILE

March 25, 2019

Regarding

- Project Overview and Issue 3: Alternatives Analysis
  - Responsive to Intervenor Group 6 witnesses Rob Wood, Andy Cutko, and Bryan Emerson on behalf of The Nature Conservancy
  - Responsive to Intervenor Group 10 witness Matt Wagner



**I. Project Overview and Issue 3: Alternatives Analysis (Relevant to DEP and LUPC Review)**

The Nature Conservancy (TNC) makes much of Central Maine Power's (CMP's) synonymous word choice in its description of the Project's purpose and need in its applications and an information request response. TNC points out that CMP has described the Project purpose and need as:

- "...to deliver up to 1,200 MW of Clean Energy Generation from Québec to the New England Control Area 1 via a High Voltage Direct Current (HVDC) transmission line, at the lowest cost to ratepayers."
- "...allowing CMP to deliver 1,200 MW of the clean energy generation from Quebec to the New England Control Area at the lowest cost to ratepayers."
- "...to deliver clean energy generation from Québec to the New England Control Area."
- "... delivering renewable hydropower energy from Canada to New England..."; and
- "...delivering 1,200 MW of clean energy generation from Quebec to the New England Control Area at the lowest cost to ratepayers..."

There are no inconsistencies between the sections and correspondence cited by TNC. All of the purpose and need descriptions include delivery of clean or renewable hydropower energy from Quebec or from Canada, to New England or to the New England Control Area. Some of these purpose and need descriptions include "lowest cost to ratepayers" as one component of the Project purpose, while others do not. None of these descriptions of Project purpose or need conflicts with any other, and the minor differences in descriptions of the Project's purpose do not amount to or constitute inconsistencies.

On pages 3-4 of his direct testimony, Matt Wagner suggests that non-transmission alternatives may be practicable alternatives to the Project. Mr. Wagner's assertion disregards the important fact that non-transmission alternatives would not accomplish the Project purpose, as stated in CMP's application and supporting materials, and as excerpted above.

**II. Conclusion**

There are no inconsistencies in the descriptions of Project purpose and need, contrary to TNC's assertion. All descriptions describe the delivery of clean or renewable energy generation from Canada to New England, despite minor differences in word choice. Further, non-transmission alternatives would not accomplish the Project purpose.

Dated: 3/18/2019

Respectfully submitted,

Gerry J. Mirabile  
Gerry J. Mirabile

STATE OF MAINE  
Kennebec, ss.

The above-named Gerry J. Mirabile did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Dated: March 18, 2019

Before, Alice Richards  
Notary Public  
Name: Alice Richards  
My Commission Expires: Jan. 4, 2025





STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED REBUTTAL TESTIMONY AND EXHIBITS OF  
MARK GOODWIN

March 25, 2019

Regarding

- Issue 1: Scenic Character and Existing Uses – Buffering for Visual Impacts
  - Responsive to Intervenor Group 2 witness David Publicover
- Issue 3: Wildlife Habitat and Fisheries -- Habitat Fragmentation
  - Responsive to Intervenor Group 1 witness Janet McMahon
  - Responsive to Intervenor Group 2 witness Roger Merchant
  - Responsive to Intervenor Group 4 witnesses, David Publicover, Aram Calhoun and Ron Joseph
  - Responsive to Intervenor Group 6, Rob Wood, Andy Cutko, Bryan Emerson, and Dr. Malcom Hunter, Jr.



**I. Issue 1: Scenic Character and Existing Uses – Buffering for Visual Impacts  
(Relevant to DEP and LUPC Review)**

**a. Response to Intervenor Group 4 Witness Dr. David Publicover**

Dr. Publicover contends that the Project fails the LUPC criteria for special exception approval because it “cannot be buffered from existing uses,” specifically the Appalachian Trail (“AT”). First, the applicable standard is that “the use can be buffered from those other uses and resources within the subdistrict with which it is incompatible.” The NECEC, which will be adjacent to an existing transmission line in a corridor already shared by the AT, is not incompatible with the AT. The widening of the cleared portion of the corridor and the addition of the transmission line will not significantly change the hiking experience in this location. Hikers currently cross an electric transmission line corridor at this location, and that will not change with the addition of the HVDC transmission line.

In addition, as stated in my pre-filed direct testimony, as of March 2014 there were 56 electric transmission line crossings of 230 kilovolts (kV) or more along the length of the AT, equating to one 230kV (or greater) transmission line crossing for every 38 miles of trail length. The number of transmission line crossings of the AT is even larger when considering transmission lines of less than 230kV. In Maine alone, there are five 115kV transmission line crossings of the AT. In fact, the Official Guide to the Appalachian Trail in Maine identifies the presence of two transmission line crossings near Troutdale Road and Joe’s Hole. Because hikers are aware of and expect to see utility corridors, and the Project has been co-located in existing corridor, there will be a negligible change in the visual impact of transmission line structures and overhead conductors to hikers using the trail. Siting the new HVDC transmission line in this

location, instead of an AT crossing location that does not have existing transmission lines, is the least impacting alternative.

The AT crosses the existing CMP transmission line in three locations by easement, and it is CMP – not the National Park Service (NPS) – that holds fee title to the land on which the existing and new transmission line will be located, and to which the NPS AT easement applies.

In any case, the Project can be buffered from AT users. The transmission line design incorporates weathering steel to buffer its visual impact. Further, CMP has agreed to plantings to further buffer the Project from the AT. These measures will provide an adequate buffer and will effectively buffer the Project from nearby uses and resources.

## **II. Issue 3: Wildlife Habitat and Fisheries -- Habitat Fragmentation (Relevant to DEP Review)**

### **a. Response to Intervenor Group 1 Witness Janet McMahon**

Ms. McMahon states on page 4 of her testimony that the Western Maine Mountains “unfragmented forests and complex topography make it a highly resilient landscape in the face of climate change.” The characterization of the Western Maine Mountains as unfragmented forest is inaccurate. The Western Maine Mountains are fragmented by many man-made and natural features including, but not limited to, rivers, streams, highways (Routes 6/15, 16, 27, and 201), the cleared and mowed area along the length of the U.S./Canada border, existing electric transmission corridors, the Central Maine and Quebec Railway, forestry clearcuts and strip cuts, skidder trails, and land management roads used by the forest products industry. Despite these existing fragmentation features, the Western Maine Mountains, as acknowledged by Ms. McMahon on pages 4 and 7 of her testimony, remain “the critical ecological link between the

forests of the Adirondacks, Vermont and New Hampshire and northern Maine, New Brunswick and the Gaspé.”

In the context of landscape-scale resiliency, in 1880 Somerset County was only sixty percent forested.<sup>1</sup> The region has not always had the same large “unfragmented forest” she describes. So assertions that the region must remain forested to retain landscape-scale ecological/wildlife habitat resiliency are not borne out by history.

Ms. McMahon also states on Page 5 of her testimony that it is “worth noting that fragmentation almost always leads to more fragmentation. As access roads are built and corridors are widened over time, as is happening in other parts of the New England Clean Energy Connect (“NECEC”) corridor, these typically create new nodes of development.” This is not accurate when applied to the NECEC Project. Other than improvements proposed to the existing land management roads on either side of the Kennebec River for construction and permanent access to the proposed high voltage direct current (“HVDC”) termination stations, Central Maine Power Company (“CMP”) is proposing only temporary access within the transmission line corridor. These access roads will be allowed to naturally revegetate and, if graded during construction, will be restored to their original contours, which satisfies the minimal alteration standard in Maine Department of Environmental Protection (“DEP”) regulations, Chapter 335, §3(b).

Ms. McMahon’s suggestion that the access roads used to build the Project will lead to additional fragmentation is thus inaccurate, and her concern is misplaced. The primary threat for additional commercial and subdivision development in the Western Maine Mountains is the existing network of land management roads because, by their very nature, they promote vehicular access. The transmission line and its restored, vegetated ROW will not promote

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<sup>1</sup> Irland, L.C. 1998. Maine's forest area, 1660-1995: Review of available estimates. Maine Agricultural and Forest Experiment Station Miscellaneous Publication 736.

vehicular access. Further, there will be no development along Segment 1 of the Project resulting from increased access to electricity because the HVDC electricity to be transmitted by CMP will not be available to users along the route because of its high voltage and because it is direct current power rather than alternating current power, and thus not usable by ordinary consumers.

Ms. McMahon's statements on page 8 comparing the Project to a permanent roadway, such as Interstate 95 ("I-95"), are misleading in at least two ways.

First, equating a scrub-shrub vegetated transmission line corridor to a primarily paved interstate or highway corridor is not accurate in terms of the movement of species and ecological flows such as organic matter. While transmission line corridors allow the movement of, and provide habitat for, numerous mammals, reptiles, amphibians, and insects, roads provide very little or no habitat for most species, and in fact create a hazard for those species attempting to walk, crawl, or fly across them because of vehicular traffic, as well as a lack of cover within which to hide from their predators.

Second, the total width of the I-95 turnpike corridor from the outside edges of the southbound to the outside edges of the northbound lanes, including cleared verges, averages approximately 300 feet, not 150 feet, as she states. Ms. McMahon's testimony does not specifically or clearly exclude the forested median in her calculation, and thus gives the misleading impression that the NECEC transmission line corridor is as wide as the entire I-95 corridor, including the median.

The impact of the Project on an already significantly fragmented working forest, restored to and maintained in an early successional scrub-shrub vegetative cover, will be insignificant because it will have neither the negative habitat effects nor the harmful and unsafe species

movement impacts of a human-made, intensively traveled and maintained, and severely habitat-depleted landscape feature such as I-95.

**b. Response to Intervenor Group 2 Witness Roger Merchant**

The NECEC as proposed avoids forest fragmentation to the extent possible and where some fragmentation is unavoidable CMP has minimized the impact of fragmentation by locating the transmission line in an area that is already significantly fragmented by forestry practices and associated impacts, and by choosing the most direct route from the Canadian border to the closest existing transmission line right of way while avoiding and minimizing impacts to protected and sensitive natural resources along this route. By Mr. Merchant's own admission, on page 3 of his testimony, the proposed alignment of Segment 1 is located in an area with habitat that is already significantly fragmented from forestry practices and an "extensive network of gravel roads." Mr. Merchant's testimony provides a comparison of forest conditions in 1942 to conditions in 2016 and acknowledges that "the extent of continuous forest cover in 2016 has been reduced by a larger, more extensive patchwork pattern from newer forest practices" that "reveals evidence of significant alteration and fragmentation of forest cover." In fact, on page 5 of his testimony Mr. Merchant characterizes the landscape between Coburn Mountain and the Quebec border as a "transitionally fragmented forest."

Mr. Merchant contends that the placement of the Project in an already fragmented landscape is unacceptable. To the contrary, the placement of the transmission line in an area that is already transitionally fragmented will have less impact to wildlife and habitat than the placement of a transmission line through a largely intact forest. As shown on Exhibit CMP-3.1-B and Exhibit CMP-3.1-A (adapted from Figure 8b of Exhibit-5-JSM), the HVDC transmission line has been carefully sited in both an area that already contains significant fragmentation and in



a manner that minimizes its distance from existing forest edges, thereby avoiding habitat and wildlife impacts where possible and minimizing additional habitat fragmentation.

Mr. Merchant states that “fragmented landscapes can facilitate additional fragmentation from commercial development and expanded subdivision.” As mentioned previously in response to the testimony of Group 1 witness Janet McMahon, the Project will not facilitate or encourage any additional fragmentation associated with temporarily constructed access roads or from access to electricity (because the electricity will be unusable direct current power).

**c. Response to Intervenor Group 4 Witness Dr. David Publicover**

*The NECEC Project will not Unreasonably Impact Wildlife Through Habitat Fragmentation.*

Dr. Publicover cites multiple sources that recognize the “region” as a large ecologically intact forest region. However, his testimony appears to conflate the Western Maine Mountains region with portions of the Central Mountains and Aroostook Highland biophysical regions and overstates the size and extent of intact forest in the Project area. In contrast, Intervenor Group 2 witness Roger Merchant has accurately testified on page 5 of his pre-filed direct testimony that the Project area in Segment 1 is a “transitionally fragmented forest.”

Although each area that has been harvested does not experience a permanent loss of forest cover (i.e., it is allowed to return to a forested condition for future harvest), the forest in this area is perpetually in this transitionally fragmented state due to the 30- to 50-year harvest cycle that is pervasive throughout the Western Maine Mountains. As Mr. Merchant rightly notes, similar to a newly constructed electric transmission corridor, “Over time, natural or artificial regeneration fills in the harvested space and edges, so the initial fragmentation and edge effects are somewhat mitigated, softened.” CMP’s proposed vegetation clearing and management

practices will encourage the regrowth of early successional vegetation, mitigating and softening the edge effect, thereby further minimizing the impact on wildlife and habitat.

Dr. Publicover contends that the Project will unreasonably harm ecological value and connectivity in the Western Maine Mountains region. The clearing of capable vegetation (i.e., vegetation capable of growing into the conductor safety zone) will not result in habitat loss, but, rather, will convert forest habitat to habitat dominated by early successional woody and herbaceous growth, which will remain permeable to the majority of wildlife species and will remain viable habitat for a wide variety of plant and animal species, and will continue to provide areas for many animal life stages and activities including hunting, browsing, nesting, resting, reproduction, and rearing.

Dr. Publicover states on Page 12-13 of his testimony that “the species most affected” by the reduction in connectivity “are those that avoid large openings or shrub or regenerating forest habitat.” Wildlife in the Western Maine Mountains, however, are frequently exposed to both large openings and shrub or regenerating forest habitat resulting from forestry activities. Yet the Western Maine Mountains remain high in ecological value and connectivity, as well as wildlife species diversity and density. The transmission corridor will not be a barrier, will not unreasonably impede wildlife movement, and will not adversely affect wildlife lifecycles.

Dr. Publicover argues on Page 12 of his testimony that “with the corridor all of this forest will be permanently subject to edge effects, reducing its ability to support interior forest species.” As discussed above in response to Group 2 witness Roger Merchant, the HVDC transmission line has been carefully sited in both an area that already contains significant amounts of fragmentation and in a manner that minimizes its distance from existing forest edges, thereby minimizing additional fragmentation and impacts on habitat and wildlife.

Dr. Publicover contends that in the absence of a transmission line corridor most of the area would potentially be interior forest. The fact is that a significant portion of Segment 1 is not interior forest (i.e., free from the influence of edge effects) due to the existing widespread logging and resulting fragmentation in this area, as noted in my responses to the testimony of Janet McMahon and Roger Merchant. Nor, if current forestry practices continue, would this area be dominated by interior forest in the future.

*The NECEC Project will not Unreasonably Impact Jack Pine Forest.*

Dr. Publicover states that the Project crosses two populations of Jack Pine Forest, ranked as an S1 natural community by the Maine Natural Areas Program (“MNAP”). Dr. Publicover states on page 17 of his testimony that “the full extent and conditions of these occurrences has not been determined.” Dr. Publicover is correct in this regard.

Botanists and biologists from Tetra Tech Inc., TRC Engineers, and Gilman & Briggs, performed rare plant and unique natural community surveys on behalf of CMP in July of 2018. The results of this survey were provided to the MNAP in September 2018. The surveys identified three Jack Pine communities within an area previously managed as industrial timberland. Recent evaluation of forest stand mapping data identified these areas as “Pine Plantations,” suggesting that these Jack Pine communities were planted and managed as industrial timberland prior to acquisition of the corridor.

Weyerhaeuser maintains an extensive GIS database that contains historic timber management practices (e.g., clearcuts, thinning, spraying, and plantings) in areas managed as industrial timberland. CMP requested from Weyerhaeuser additional information for the portion of ROW where the Jack Pine communities were documented. The information provided

indicated that a large portion, if not all, of these Jack Pine communities are not natural communities but were created through containerized plantings in the 1980s.

MNAP reviewed the survey report and determined that these areas are Jack Pine Forest communities. MNAP did not field verify this conclusion, but based its determination on evaluation of aerial imagery (Exhibit CMP-3.1-C).

Dr. Publicover also states that a “minor relocation of the proposed corridor would eliminate the impact to these rare natural community occurrences.” Dr. Publicover goes on to state that the jack pine communities “were not known when the route was being identified....precluding the opportunity to route the corridor around them.” Understanding that this is industrial timberland, CMP routed the corridor in this area to minimize the impacts to Inland Waterfowl and Wading Bird Habitat and avoid the wetlands around Egg Pond while maintaining as much distance from the Moose River as possible. Relocating the corridor as suggested by Dr. Publicover would increase impacts to IWWH and these wetlands and decrease separation from the Moose River.

Although these Jack Pine communities apparently were artificially created through plantings, and thus are not protected, CMP’s alignment on the south side of the 300-foot-wide corridor, as shown on Exhibit CMP-3.1-C, avoids and minimizes impact, leaving them largely intact. In addition, until it can be conclusively determined that these areas are not in fact unique natural communities, CMP has proposed compensation for unavoidable impact to both the portion of the community directly impacted and to a 250-foot environmental impact zone to address edge effects, as recommended by MNAP, through a contribution to the Maine Natural Areas Conservation Fund of more than \$1.2 million.

*The NECEC Project has Avoided, Minimized, and Adequately Mitigated for Unavoidable Impacts.*

Dr. Publicover argues that the project has not provided adequate mitigation. To the contrary, CMP has proposed meaningful and significant monetary and conservation land contributions, including the following specific measures to avoid, minimize, or otherwise address habitat fragmentation impacts:

- avoided new habitat fragmentation impacts by co-locating the majority (72%) of the transmission line in existing transmission corridors;
- minimized impact by expanding riparian buffers to distances recommended by DEP and the Maine Department of Inland Fisheries and Wildlife (“DIFW”) to protect both fisheries habitat and water quality and provide travel corridors in riparian areas;
- minimized impact through integrated vegetation management practices and erosion and sedimentation control best management practices;
- avoided impacts to Roaring Brook Mayfly (a state-threatened species) and Northern Spring Salamander (a species of special concern) by proposing structures tall enough to retain full height canopy, as requested by MDIFW, at Gold Brook and Mountain Brook;
- minimized impact by proposing to retain up to 15-foot-tall softwood species in Rusty Blackbird habitat;
- minimized habitat fragmentation impact with the proposed maintenance of 10 deer winter travel corridors in the upper Kennebec River Deer Wintering Area (“DWA”) and by proposing the preservation of lands within the DWA totaling 717 acres; and
- offered nearly \$6 million in in-lieu fees and other fees and contributions, and nearly 2,100 acres of additional land conservation, to offset unavoidable forest habitat conversion of wetlands, Inland Waterfowl and Wading Bird Habitat, Significant Vernal Pool Habitat, and DWA.

**d. Response to Intervenor Group 4 Witness Dr. Aram Calhoun**

Of the sixty-two (62) significant vernal pools identified near or within the Project area using field survey protocols recommended by the MDEP and the USACE, only 12 are located



within or adjacent to the new corridor (Segment 1). CMP's consultants identified these features, and the Project alignment was designed to avoid or minimize impacts to these habitats.

As a result, three (3) significant vernal pools were completely avoided, with no impacts to either the pool depression or the critical terrestrial habitat; seven (7) pool depressions are located outside of the proposed developed ROW and will have only portions of their critical terrestrial habitats cleared of forest vegetation; one (1) pool depression and its critical terrestrial habitat are only partially within the proposed developed ROW; and one (1) pool depression is entirely within the proposed developed ROW and will be cleared of vegetation but will only have a portion of its critical terrestrial habitat cleared.

The remaining 50 significant vernal pools are located within or near the co-located portions of the Project. In both the new and co-located portions of the Project, the majority of significant vernal pools and their critical terrestrial habitats are within or adjacent to forested areas and will remain so post-construction. As a result, impacts have been avoided and minimized to the extent possible and forest connectivity will be retained.

As noted in Dr. Calhoun's testimony on Page 5, "Pool-breeding amphibians are present in breeding pools for, at most, a few weeks in the spring; and adults and juveniles spend the majority of their lives in the adjacent forests and often use other pools during migration to and from summer, fall, and hibernation habitats in the forest." Dr. Calhoun further states "Destruction of individual pools or clearing of connecting forested habitats for the purpose of utility rights-of-way (ROW) may fragment poolscales and have a negative impact on populations of pool-breeding amphibians." No significant vernal pools will be destroyed or directly impacted, i.e., filled, as the result of the construction of the Project and the majority of significant vernal pool depressions are located within either existing cleared ROW or in forested

areas not proposed for clearing (i.e., outside of the NECEC ROW). In most cases, the only impact will be the clearing of a portion of critical terrestrial habitat. Further, nearly all of the significant vernal pool critical terrestrial habitats impacted by the Project will remain partially forested and connected, by way of forested and/or early successional vegetative cover, to adjacent forest habitat following construction of the NECEC ROW. As a result, impacts to significant vernal pools from habitat fragmentation will be minimal and will not be unreasonable or adverse.

Dr. Calhoun cites research on page 6 of her testimony that concluded that “pool breeding amphibians need intact forested habitat as far as 1,500 feet (~500 m) from the breeding pool to support a significant portion of the adult population and much longer distances for juvenile dispersal.” As stated previously, forest connectivity, in relation to the spatial distribution of significant vernal pools within the vicinity of the Project, will not be significantly affected by construction, and, in most cases, forested land extends for significant distances on both sides of the proposed ROW. Because the majority of significant vernal pools located within the Project area will not be completely surrounded by non-forested habitat as a result of clearing, the impact on emigration and staging areas for pool-breeding amphibians will be minimal. Portions of most forested significant vernal pool depressions and their forested critical habitats will remain largely intact following construction.

**e. Response to Intervenor Group 4 Witness Ron Joseph**

Mr. Joseph’s claim is that CMP has not adequately avoided impacts to DWAs. To the contrary, CMP first sited the transmission line within existing corridors to the extent possible (72% of the new transmission line will be co-located) such that additional fragmentation will be avoided or minimized. CMP consulted with MDIFW to understand impacts to DWAs and

develop a mitigation plan for the upper Kennebec River DWA. Through this process, MDIFW informed CMP, during a November 9, 2018 meeting, that co-location of the line was adequate for minimization of impact in the southern portions of the Project because these DWAs were already fragmented, have typical snow depths that are less of an impediment to deer movement than areas farther north and west, experience shorter-duration winter conditions compared to northern reaches of the Project, and have higher deer populations. Conversely, MDIFW specifically requested and had significant input into the development of the deer travel corridors and compensation for impacts in the upper Kennebec River DWA. MDIFW determined that the 10 proposed travel corridors, along with the preservation of seven parcels of CMP-owned land within the DWA, are adequate to avoid undue adverse impacts and to offset unavoidable impacts to the DWA.

**f. Response to Intervenor Group 6 Witnesses Rob Wood, Andy Cutko, and Bryan Emerson (herein collectively referred to as TNC Staff), and Dr. Malcolm Hunter, Jr.**

TNC staff surmise that because 38 M.R.S. § 480-D(3) mentions “significant wildlife habitat” and “travel corridors” separately, it suggests that mapped deer travel corridors fall under the definition of “significant wildlife habitat.” Under the NRPA, 38 M.R.S. § 480-B(10), the definition of “significant wildlife habitat” includes “high and moderate value deer wintering areas and travel corridors as defined by the Department of Inland Fisheries and Wildlife.” All DWAs crossed by the Project, however, are indeterminate in value and thus do not meet the definition of significant wildlife habitat, so deer travel corridors in these DWAs also do not meet the definition of significant wildlife habitat.

Although TNC staff are mistaken about the significance of DWA travel corridors, CMP is providing mitigation for potential impacts to them. CMP has provided mitigation in the form

of ten (10) maintained or natural deer travel corridors in the upper Kennebec DWA and compensation in the form of preservation of tracts of land within the upper Kennebec DWA in an amount that far exceeds the standard 8:1 preservation ratio.

TNC staff characterize the lands within Segment 1 of the Project as an unfragmented forest block. As discussed in response to witness Janet McMahon, the Western Maine Mountains region is fragmented by a number of natural and non-natural features and forestry practice impacts.

TNC staff note on page 4 of their testimony that “A growing body of research presents findings on the negative impacts of habitat fragmentation, ranging from edge effects (caused by sharp transitions from one habitat to another), to spread of invasive species, to increased pressure from associated uses (such as motorized vehicle use), to changes in species composition and behavior over time from reduced habitat patch sizes.” These concerns are misplaced for the NECEC Project.

The transmission line in Segment 1 of the Project will be allowed to naturally revegetate in a manner that will provide for wildlife travel corridors within and across the ROW. Vegetation in the ROW will resemble a u-shaped pattern, with taller non-capable species on the edges and shorter non-capable species beneath the conductors. In this manner, the corridor will result in a gradual, buffered transition to the forest edge. CMP’s vegetation management practices utilize integrated vegetation management methods promoted by the EPA to enhance wildlife habitat and connectivity and minimize edge effects. In addition, The Habitat Network,<sup>2</sup> a partnership established between TNC and the Cornell Lab of Ornithology, recognizes the importance of:

- the potential for utility corridors to connect natural landscapes and improve habitat conditions for certain wildlife;

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<sup>2</sup> <http://content.yardmap.org/learn/managing-utility-corridors-wildlife/>

- minimizing hard edge impact on fragmentation by applying soft edge management techniques (i.e., integrated vegetation management) and maintaining “vegetation bridges” for wildlife movement; and
- promoting an arrested shrub layer in utility ROWs, which allows the corridor to act as a habitat connection between isolated plant and/or animal communities.

Severe topography in much of Segment 1 will discourage motorized use of the ROW, thereby limiting the spread of invasive species by recreational vehicles. Equipment used to construct the Project is no more likely to transport invasive species than the equipment used by forestry operations or the recreational vehicles that are already used in the Western Maine Mountains. In fact, they are less likely to do so; Exhibit 10-1 of the Site Law Application contains specific timber mat requirements to reduce the potential for the spread of invasive species.

Dr. Hunter notes on page 6 of his testimony that “the current rarity of invasive plants in the region increases the importance of keeping them out, because after new populations establish in remote locations, they may go undetected and uncontrolled for many years.” CMP has committed to developing and implementing an invasive species survey and control plan to address any post-construction increases or new incidences of invasive species present within areas impacted by construction of the Project. This plan will span multiple years and treatment, if needed, will be designed to control invasive species such that their abundance level is no higher than that identified during pre-construction invasive species surveys.

TNC staff also state on Page 4 of their testimony that “Fragmentation is of particular concern for wildlife species that require mature, closed-canopy forest cover, such as the American marten and many interior forest nesting birds.” Dr. Hunter further notes on page 5 of his testimony that “In Maine there are more than two dozen bird species...that are associated



with forest interiors and are listed as Species of Greatest Conservation Need (“SGCN”).” The NECEC will not adversely impact these species.

According to the 2015 Maine Wildlife Action Plan (“WAP”), northern hardwood and conifer forests, which account for 40% of habitat cover types in Maine, support 153 SGCN. More than two dozen bird species listed as SGCN are found in forest interiors, the majority of the state is forested, and the number is relative to the amount of habitat. While it is true that certain wildlife species require mature, closed-canopy forest, there is no shortage of interior forest habitat in the Western Maine Mountains region to support these species, and the NECEC transmission line will not change that. For perspective, Janet McMahon’s testimony states that the Western Maine Mountains region encompasses a vast area of over five million acres, and Segment 1 of the NECEC will occupy less than 1,000 acres of this region, or less than 0.01% of the Western Maine Mountains region. Ample habitat will remain available for SGCN after Project construction.

TNC staff incorrectly states on Page 4 of their testimony “that CMP has not proposed any measures to avoid, minimize, or compensate for these impacts.” Similarly, Dr. Hunter concludes on page 8 of his testimony that “the proposed mitigation and compensation plan does not adequately address the cumulative impacts to the full array of Maine’s wildlife.” To the contrary, as described in response to Group 2 witness Dr. Publicover above, CMP has proposed numerous measures to avoid, minimize, and compensate for habitat fragmentation impacts. As noted in CMP witness Lauren Johnston’s rebuttal testimony, DIFW has stated, by email dated March 18, 2019, that CMP has “address[ed] the Department’s remaining resource impact concerns for the NECEC project.”

TNC staff also argue on Page 5 of their testimony that “sustainable forestry does not fragment large forest blocks in the same manner as a wide, linear corridor, which bisects the landscape. A 53.5-mile corridor would create 107 miles of new habitat edge, while business-as-usual timber harvesting will result in significantly less edge—and, moreover, timber harvesting edge will change over time, whereas edge from a new transmission corridor will likely be permanent.” TNC staff are incorrect.

Maine Forest Service statistics<sup>3</sup> for timber harvests in Franklin and Somerset counties for the period 2015-2017 show that a total of 27,368 acres of forest were clearcut during those three years. For perspective, the linear edge length using the smallest possible edge length for an acre, i.e., a circle, is 740 feet. The distance of edge habitat, using the data provided above for Franklin and Somerset counties, created by clearcutting during this period is equivalent to 3,836 miles, or approximately 36 times the size of edge habitat (107 miles) that would be created by the NECEC Project. The average size of clearcuts reported during this period was 30 acres, and thirty-four of these clearcuts exceeded 75 acres in size.

Timber harvesting edge changes spatially over time, but it remains a persistent impact in the Western Maine Mountains because it is an annual occurrence. The maximum width of the ROW on Segment 1 will be 150 feet, likely far less than the significant widths created by clearcuts of 30 acres or more. If wildlife continue to thrive and remain connected in a region that routinely has new edge created at significant widths and distances, and over a very large area, by the forestry industry, then it is reasonable to conclude that wildlife connectivity will not be unreasonably impacted by a 150-foot-wide vegetated ROW.

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<sup>3</sup> [https://www.maine.gov/dacf/mfs/publications/annual\\_reports.html](https://www.maine.gov/dacf/mfs/publications/annual_reports.html)

TNC staff and Dr. Hunter both suggest that an expansion of CMP's mitigation strategies is needed to further minimize habitat fragmentation impacts. Specifically, TNC staff identify nine areas they feel merit taller vegetation, in a manner similar to the DWA travel corridors proposed by CMP at the Upper Kennebec River and the taller structures to allow full height canopy at Gold Brook and Mountain Brook. This is not necessary. There will be suitable cover and habitat for wildlife movement across the ROW due to the vegetation management practices that CMP will employ and the riparian buffers that will be maintained. Further, CMP consulted extensively with DIFW on travel corridors and resolved this issue to the satisfaction of the agency.

CMP has adequately avoided, minimized, and proposed appropriate and adequate compensation for impacts associated with habitat fragmentation. CMP has proposed mitigation in the form of compensation for impacts to the upper Kennebec DWA and conversion of forested wetlands, forested significant vernal pool habitat, and forested inland wading bird and waterfowl habitat. There is no basis for the TNC staff's request for between 40,000 and 100,000 acres of preservation lands.

### **III. Conclusion (Relevant to DEP and LUPC Review)**

The conversion of forest habitat to early successional habitat will not unreasonably harm wildlife habitat or unreasonably disturb wildlife through habitat fragmentation. CMP has avoided and minimized impacts to wildlife from habitat fragmentation through siting 72% of the transmission line within existing transmission line corridors, by proposing to use integrated vegetation management techniques, through minimization measures developed in consultation with DEP and DIFW, and through a robust compensation plan to offset unavoidable impacts.

The co-location of new transmission line within a CMP-owned corridor crossed by the AT is consistent with the existing use and with hikers' expectation of crossing a transmission line corridor in the associated P-RR subdistrict. Further, poles will be made of weathering steel to buffer and minimize their visual impact. Proposed plantings at Troutdale Road and Joe's Hole will buffer the view when looking down the corridor. As a result, the proposed transmission line crossing of the P-RR zone satisfies the criteria for special exception.

Exhibits:

CMP-3.1-A: Maine Forested Lands – Distance to Forest Edge-NECEC Overlay

CMP-3.1-B: Existing Transportation Infrastructure Overview Maps

CMP-3.1-C: MNAP Jack Pine Forest Habitat Maps

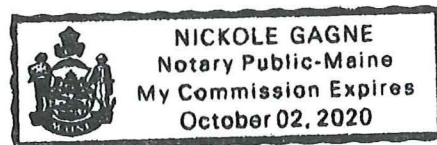
Dated: 3.19.2019

Respectfully submitted,

  
Mark GoodwinSTATE OF MAINE  
CUMBERLAND, ss.  
COUNTY

The above-named Mark Goodwin did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Before,

Dated: 3/19/2019  
Notary PublicName: NICKOLE GAGNEMy Commission Expires: 10/2/2020





# Maine Forested Lands Distance to Edge

5475

WESTERN MAINE MOUNTAINS

## Legend

- Direct Current Transmission Line (new ROW)
- Direct Current Transmission Line (existing ROW)
- Rebuild Sections
- New 345 kV Line

## Distance from Forest Edge (m)

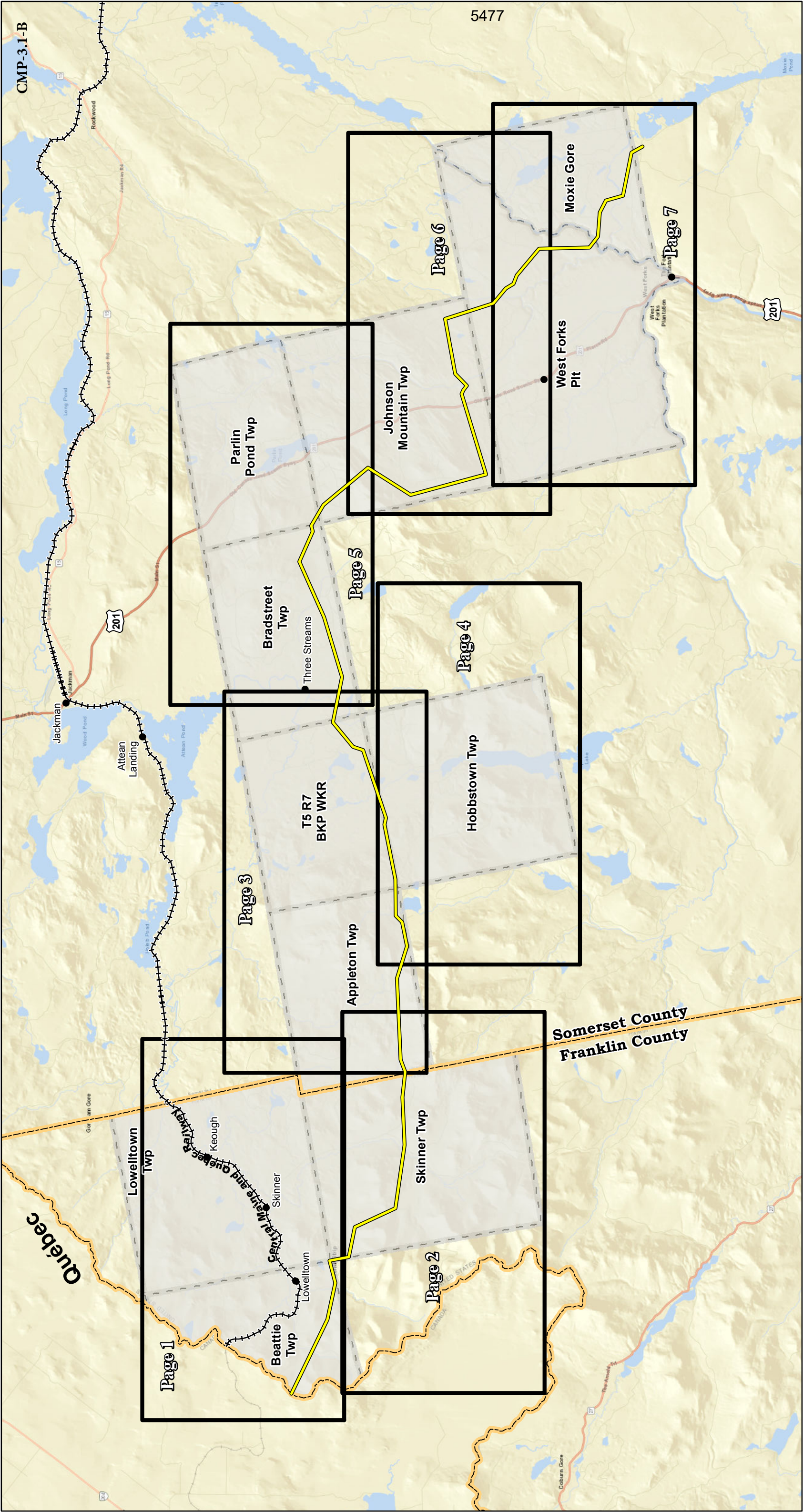
- 0–100
- 100–150
- 150–200
- 200–300
- 300–400
- 400–500
- 500–600
- 600–800
- 800–900
- 900–1,000
- Greater than 1,000

Source (adapted from):  
McMahon, J. 2018. The Environmental Consequences of Forest Fragmentation in the Western Maine Mountains. Occasional Paper No. 2, Maine Mountain Collaborative, Phillips, ME (map courtesy of The Nature Conservancy)

0 10 20 Miles







Populated Place

HVDC (New ROW)

Railroad

Page Boundary

County Boundary

Township Boundary Crossed by HVDC (New ROW)

Existing Transportation Infrastructure Overview

Franklin and Somerset Counties, Maine

01.536

Miles

1" = 3 miles

INDEX

Central Maine Power

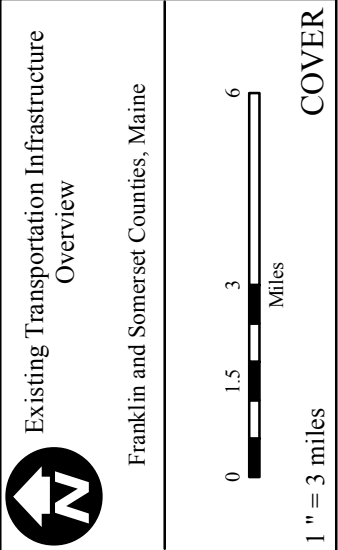
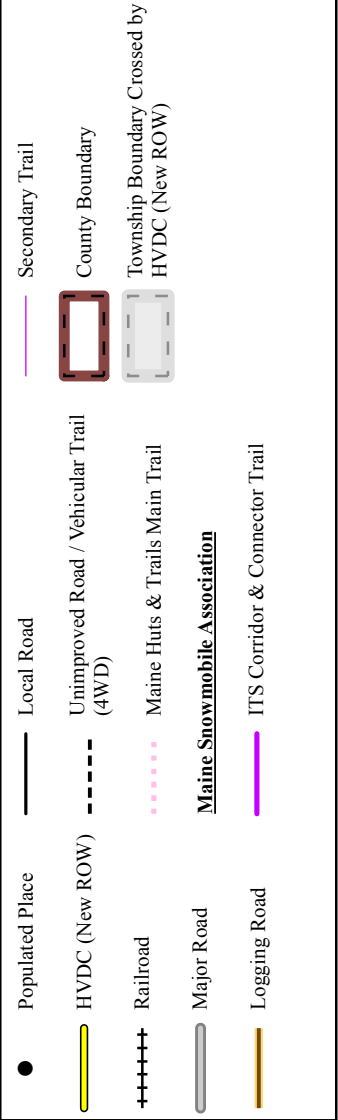
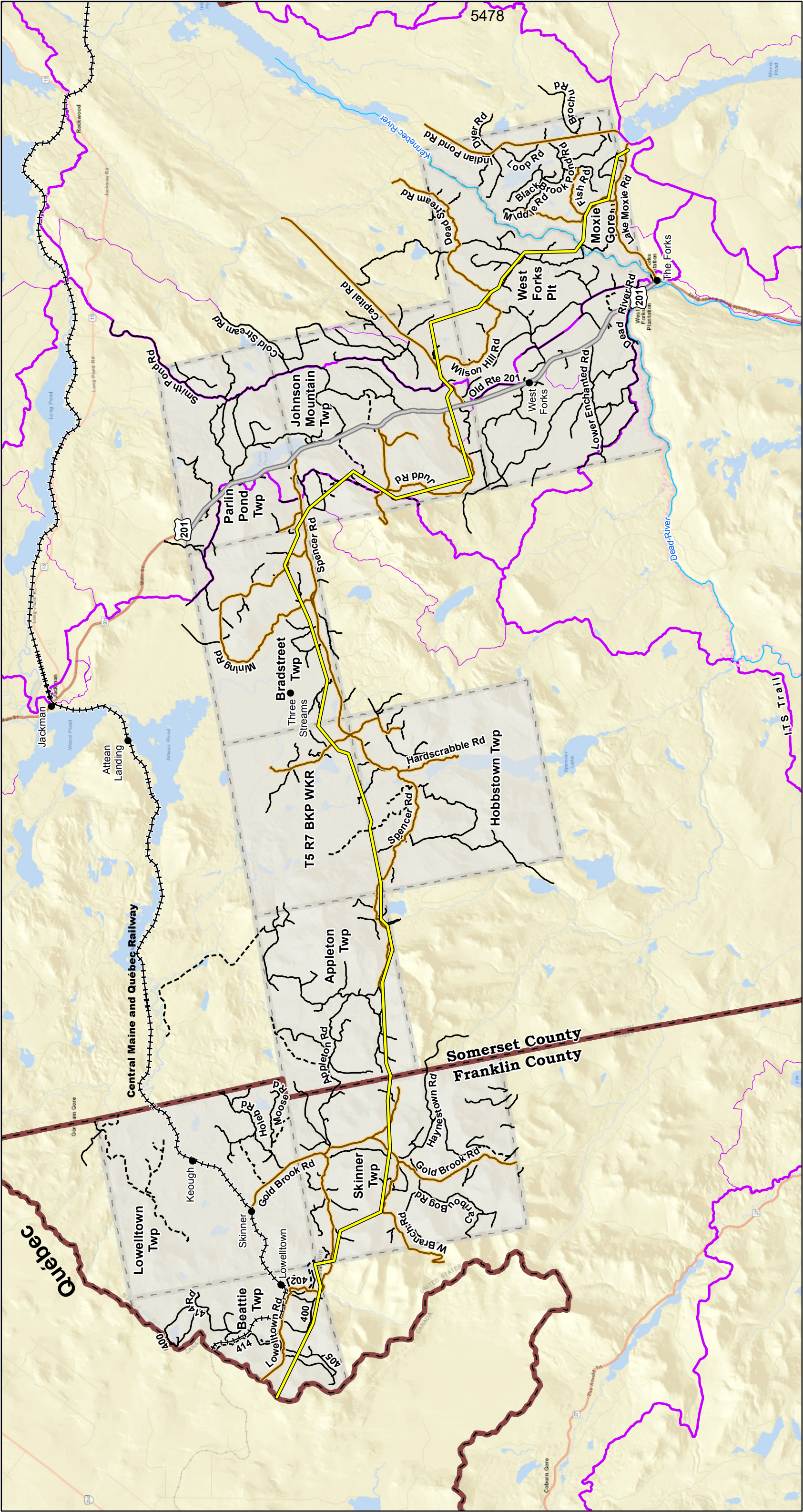
New England Clean Energy Connect

CENTRAL MAINE POWER

NEW ENGLAND CLEAN ENERGY CONNECT

Date: 3/20/2019; Author: AW; Project: 144357





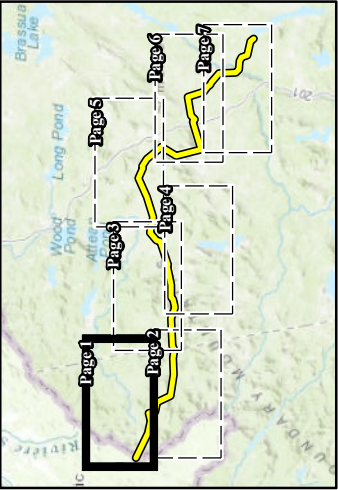
### Central Maine Power

New England Clean Energy Connect


NEW ENGLAND  
CLEAN ENERGY  
CONNECT

Date: 3/20/2019; Author: AW; Project: 144357





|      |                 |       |                                             |
|------|-----------------|-------|---------------------------------------------|
| ●    | Populated Place | ---   | Unimproved Road / Vehicular Trail (4WD)     |
| —    | HVDC (New ROW)  | □     | Lake/Pond (NHD)                             |
| ++++ | Railroad        | - - - | Page Boundary                               |
| —    | Logging Road    | □     | Township Boundary Crossed by HVDC (New ROW) |
| —    | Local Road      |       |                                             |



Existing Transportation Infrastructure Overview

Franklin and Somerset Counties, Maine

0

2,000

4,000

8,000

Feet

1" = 4,000'

Page 1 of 7

Central Maine Power

New England Clean Energy Connect



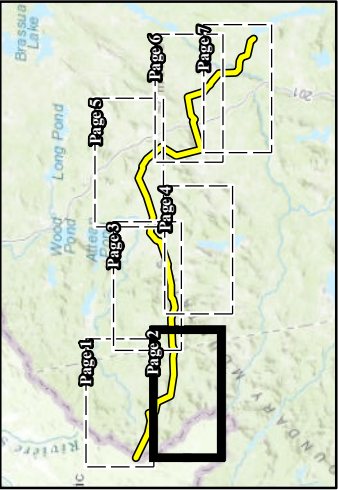
CENTRAL MAINE POWER



NEW ENGLAND CLEAN ENERGY CONNECT

Date: 3/20/2019; Author: AW; Project: 144357





HVDC (New ROW)

Logging Road

Local Road

Unimproved Road / Vehicular Trail (4W/D)

Lake/Pond (NHD)

Page Boundary

Township Boundary Crossed by HVDC (New ROW)

Existing Transportation Infrastructure Overview

Franklin and Somerset Counties, Maine

0200040008000

Feet

1" = 4,000'

Page 2 of 7

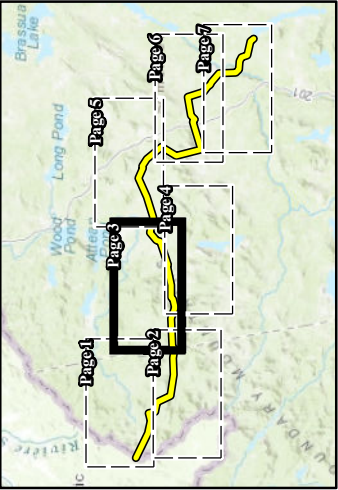
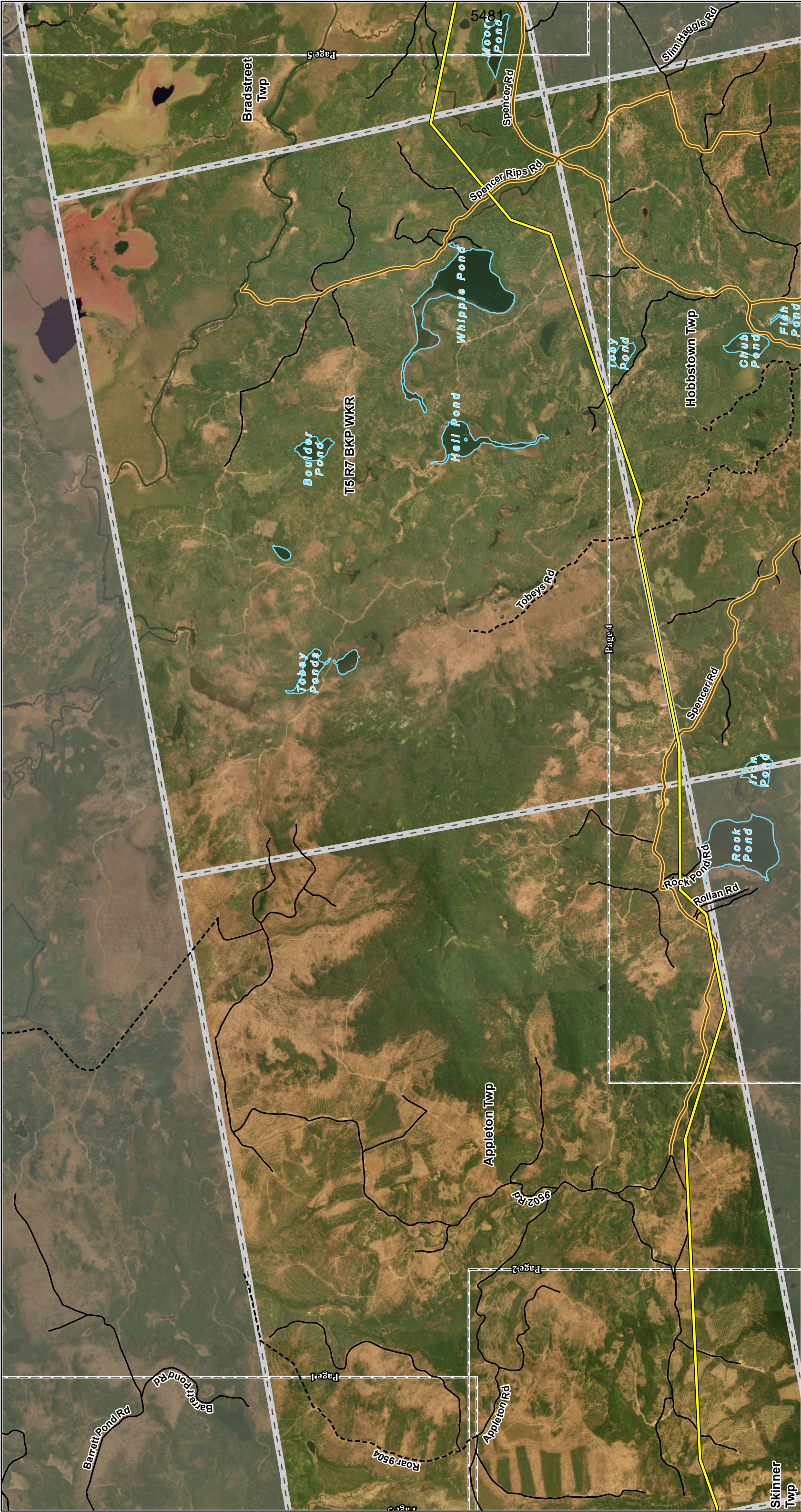
Central Maine Power

New England Clean Energy Connect

NEW ENGLAND CLEAN ENERGY CONNECT

Date: 3/20/2019; Author: AW; Project: 144357





HVDC (New ROW)

Logging Road

Local Road

Unimproved Road / Vehicular Trail (4W/D)

Lake/Pond (NHID)

Page Boundary

Township Boundary Crossed by HVDC (New ROW)

Existing Transportation Infrastructure Overview

Franklin and Somerset Counties, Maine

02,0004,0008,000

Feet

1" = 4,000'

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Central Maine Power

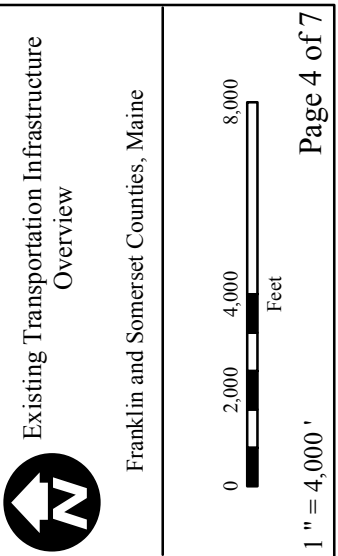
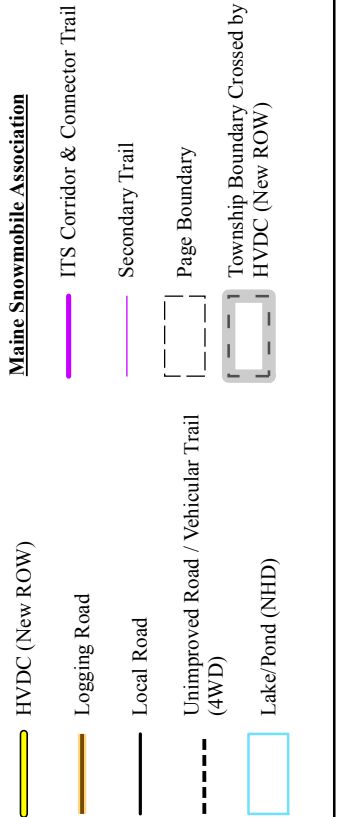
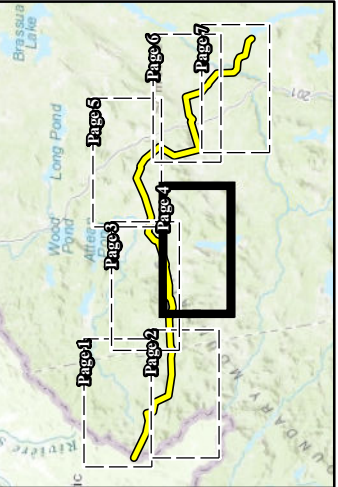
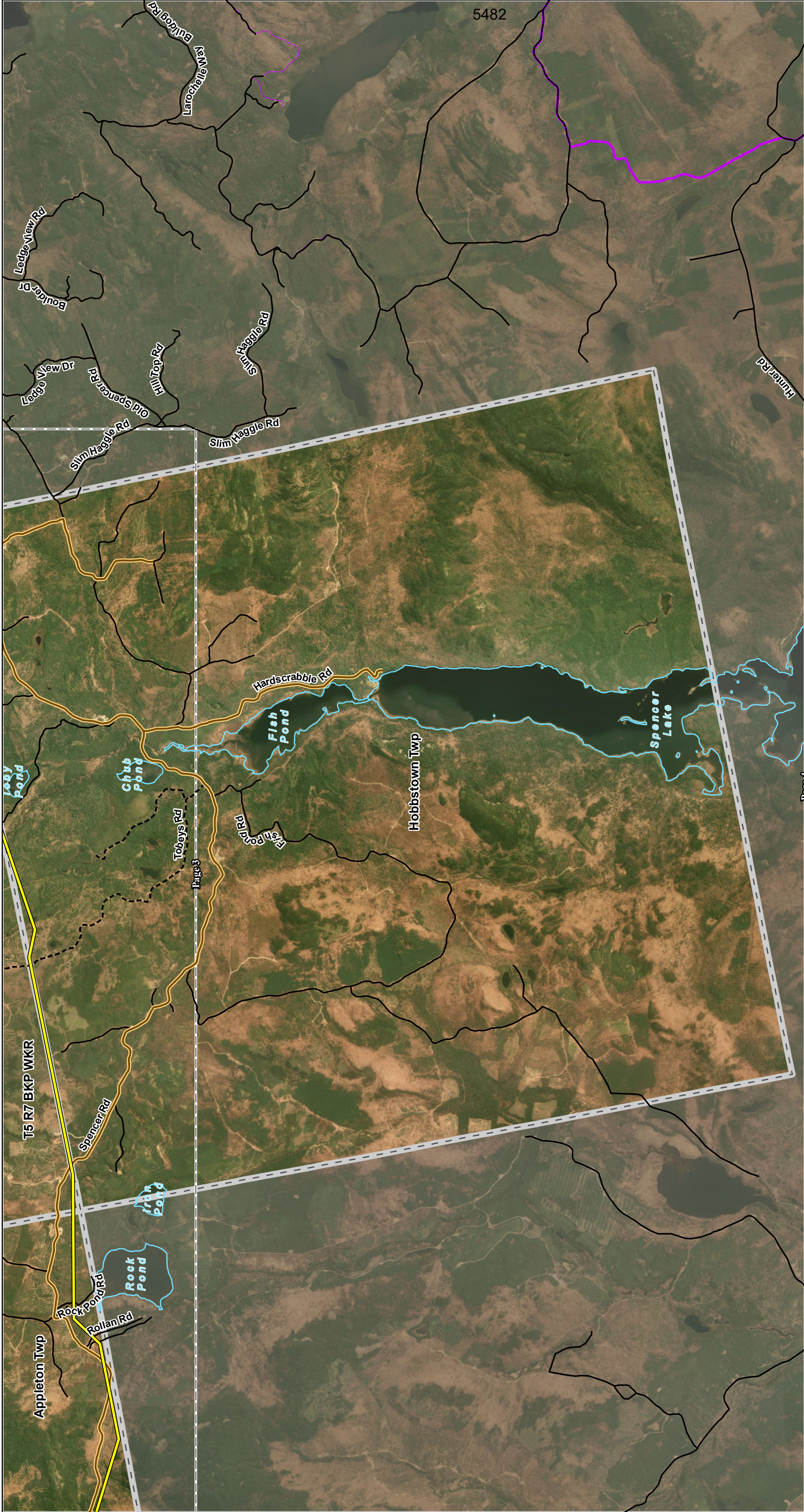
New England Clean Energy Connect

CENTRAL MAINE POWER

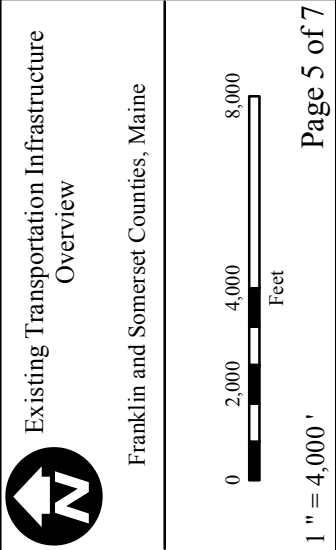
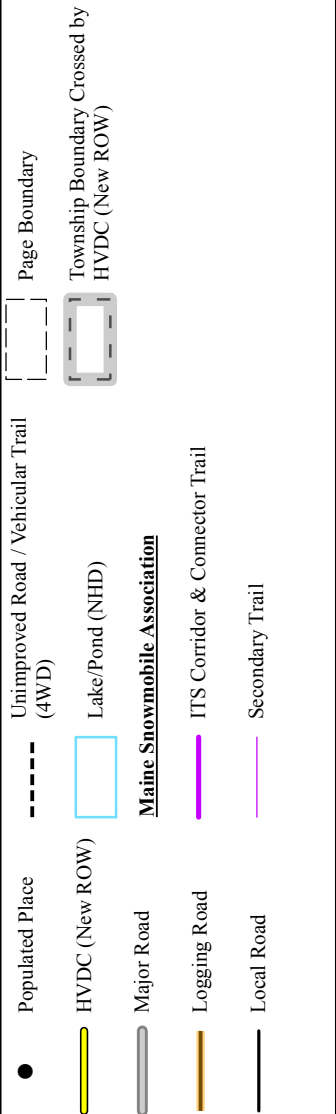
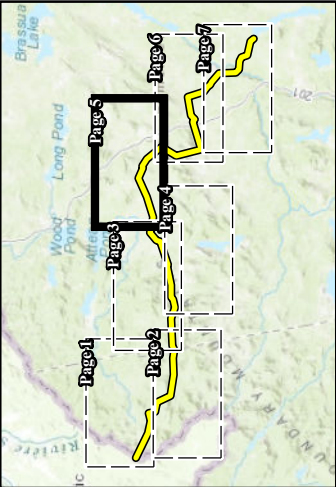
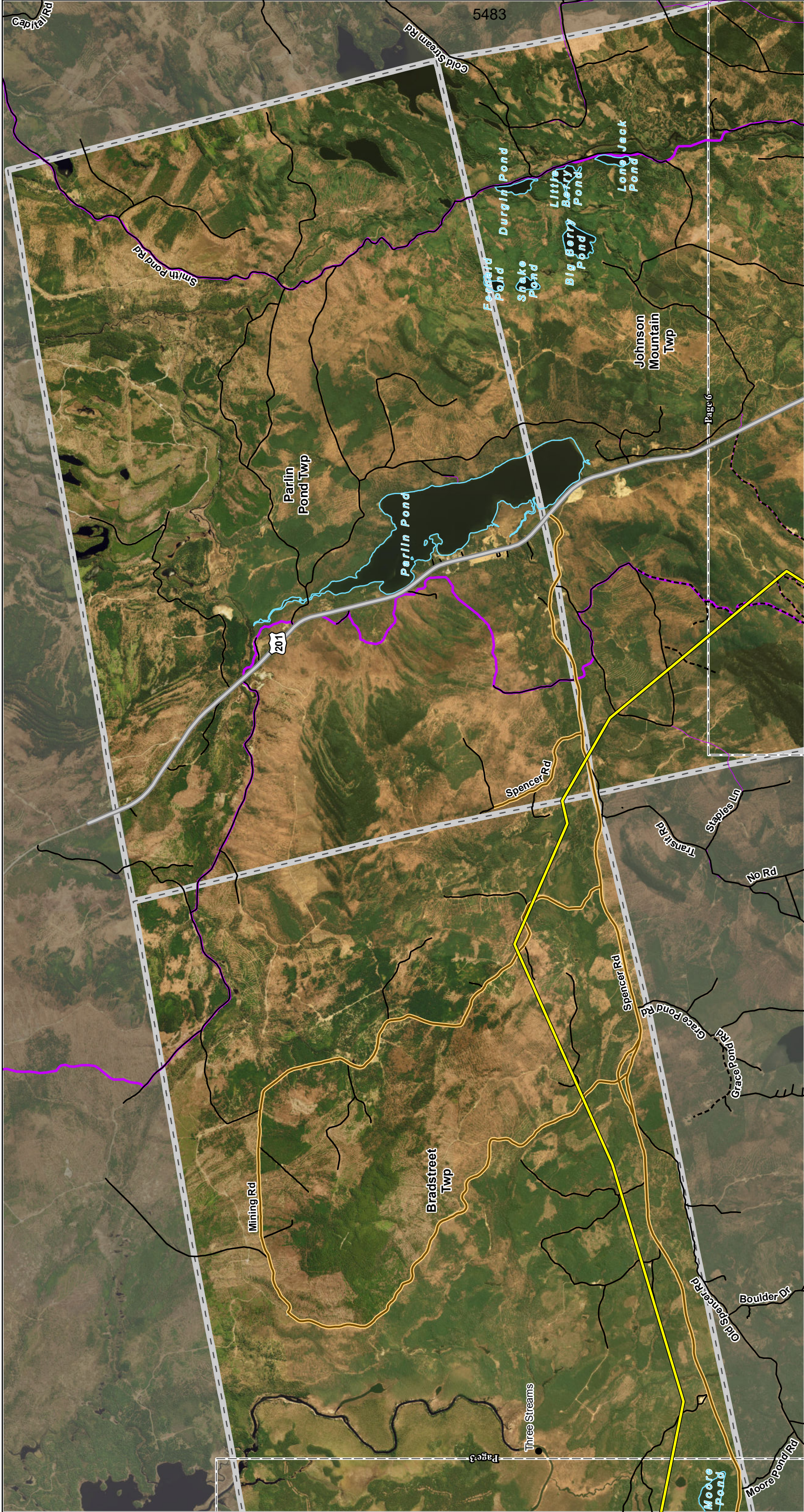
NEW ENGLAND CLEAN ENERGY CONNECT

Date: 3/20/2019; Author: AW; Project: 144357

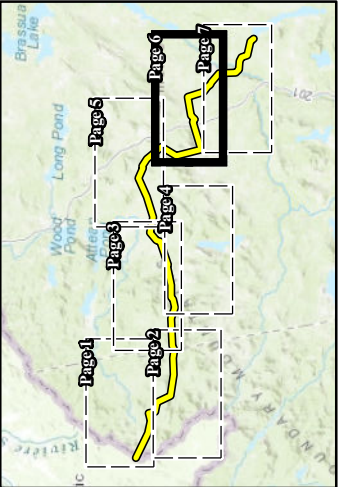
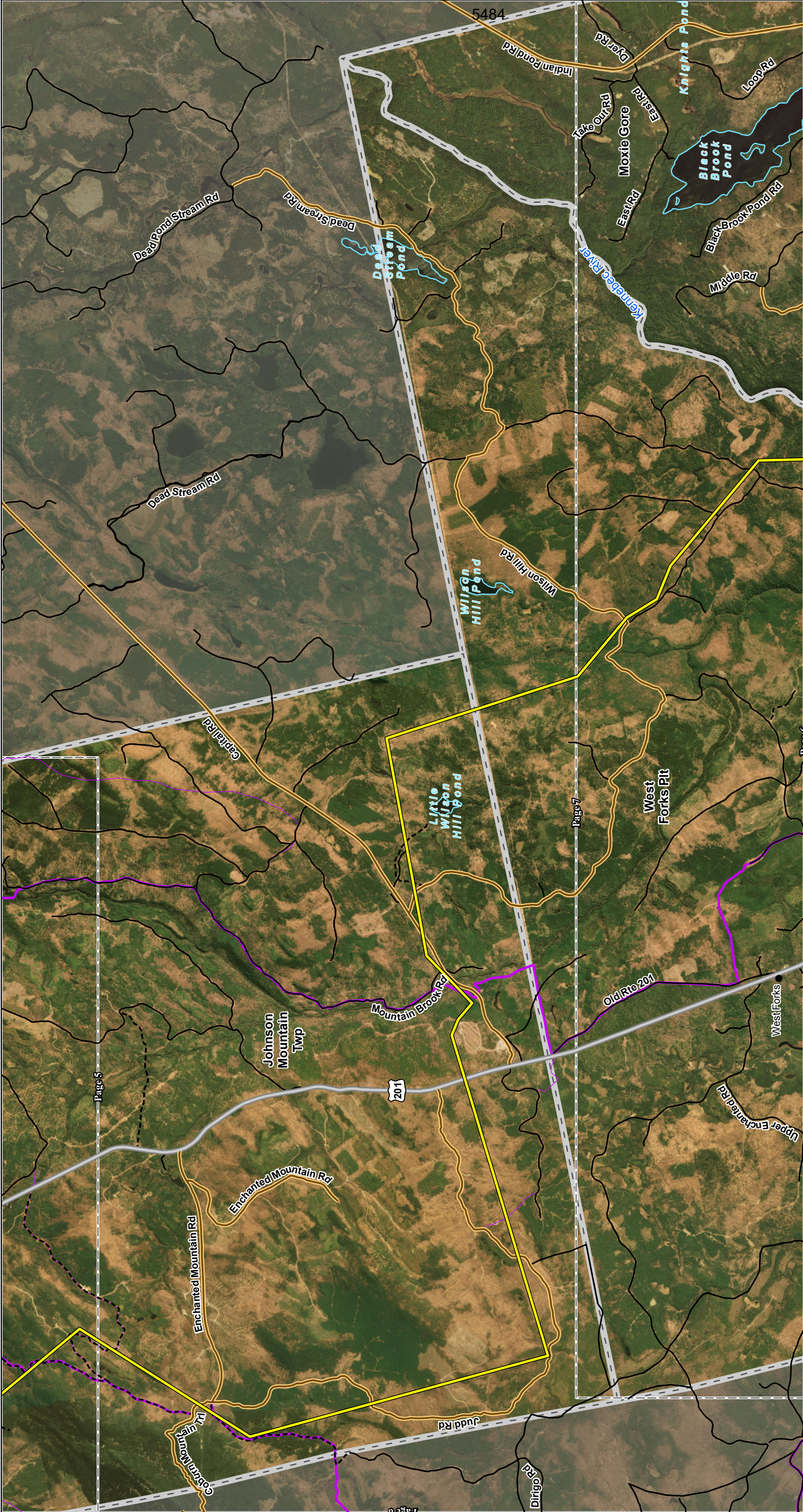












|             |                 |                                     |                                         |          |                                             |
|-------------|-----------------|-------------------------------------|-----------------------------------------|----------|---------------------------------------------|
| ●           | Populated Place | ---                                 | Unimproved Road / Vehicular Trail (4WD) | ---      | Page Boundary                               |
| Yellow line | HVDC (New ROW)  | Blue box                            | Lake/Pond (NHD)                         | Grey box | Township Boundary Crossed by HVDC (New ROW) |
| Grey line   | Major Road      | <b>Maine Snowmobile Association</b> |                                         |          |                                             |
| Brown line  | Logging Road    | Purple line                         | ITS Corridor & Connector Trail          |          |                                             |
| Black line  | Local Road      | Light purple line                   | Secondary Trail                         |          |                                             |

Existing Transportation Infrastructure Overview

Franklin and Somerset Counties, Maine

0 2,000 4,000 8,000 Feet

1" = 4,000'

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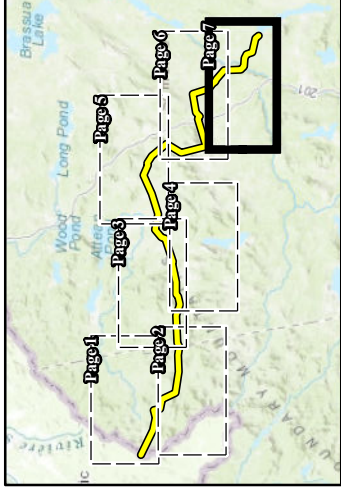
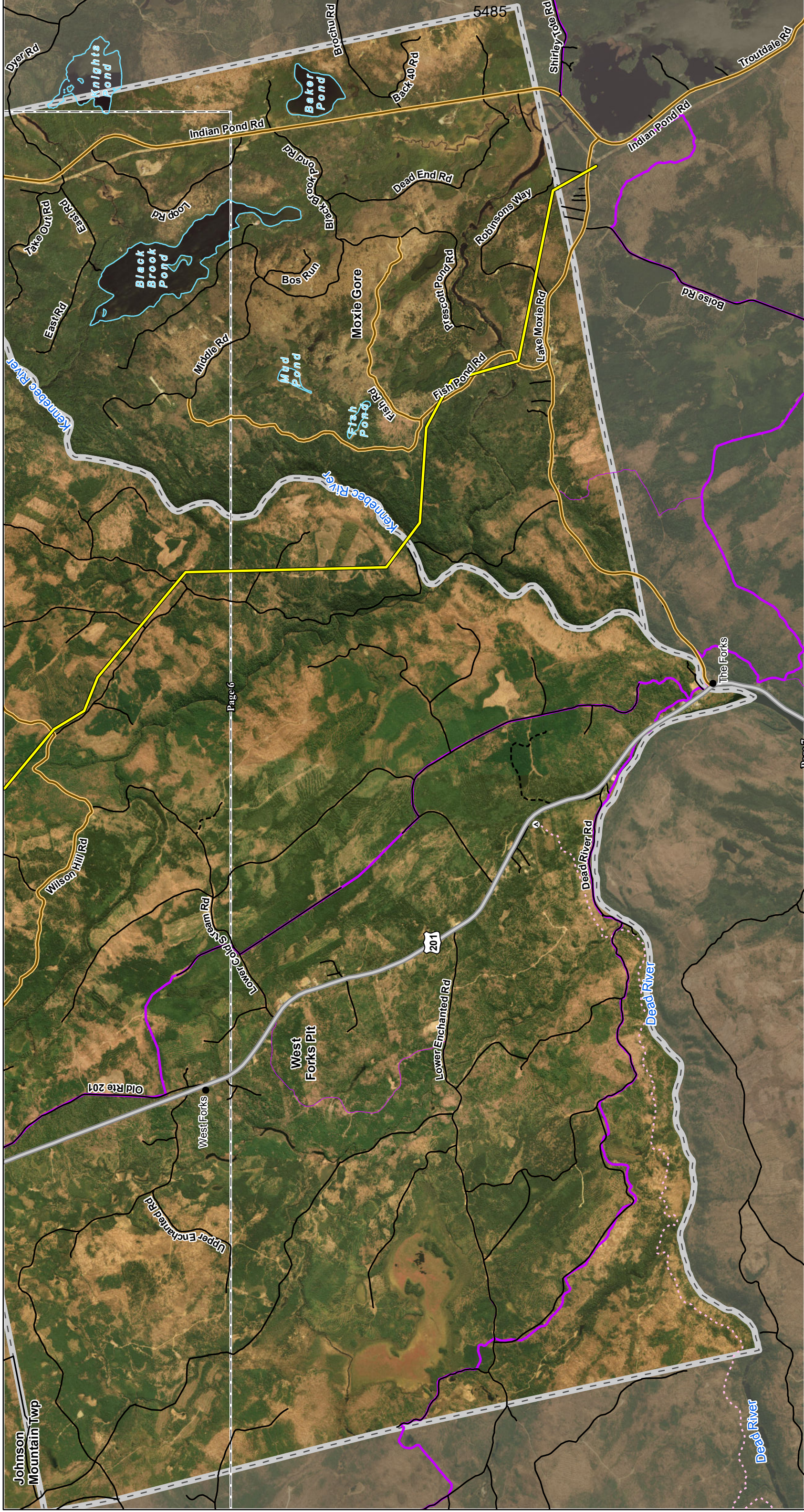
### Central Maine Power

New England Clean Energy Connect

NEW ENGLAND  
CLEAN ENERGY  
CONNECT

Date: 3/20/2019; Author: AW; Project: 144357





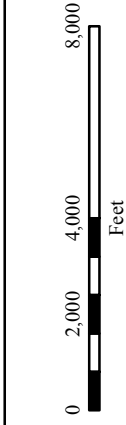
## Maine Snowmobile Association

- | Maine Snowmobile Association |                                             |
|------------------------------|---------------------------------------------|
| ● Populated Place            | — Local Road                                |
| Ⓐ Maine Huts & Trails Hut    | Unimproved Road / Vehicular Trail (4WD)     |
| — HVDC (New ROW)             | Lake/Pond (NHD)                             |
| — Major Road                 | Maine Huts & Trails Main Trail              |
| — Logging Road               |                                             |
|                              | ITS Corridor & Connector Trail              |
|                              | Secondary Trail                             |
|                              | Page Boundary                               |
|                              | Township Boundary Crossed by HVDC (New ROW) |

## Existing Transportation Infrastructure

# Overview

Franklin and Somerset Counties, Maine

 $1'' = 4\,000'$ 

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# Central Maine Power

# New England Clean Energy Connect

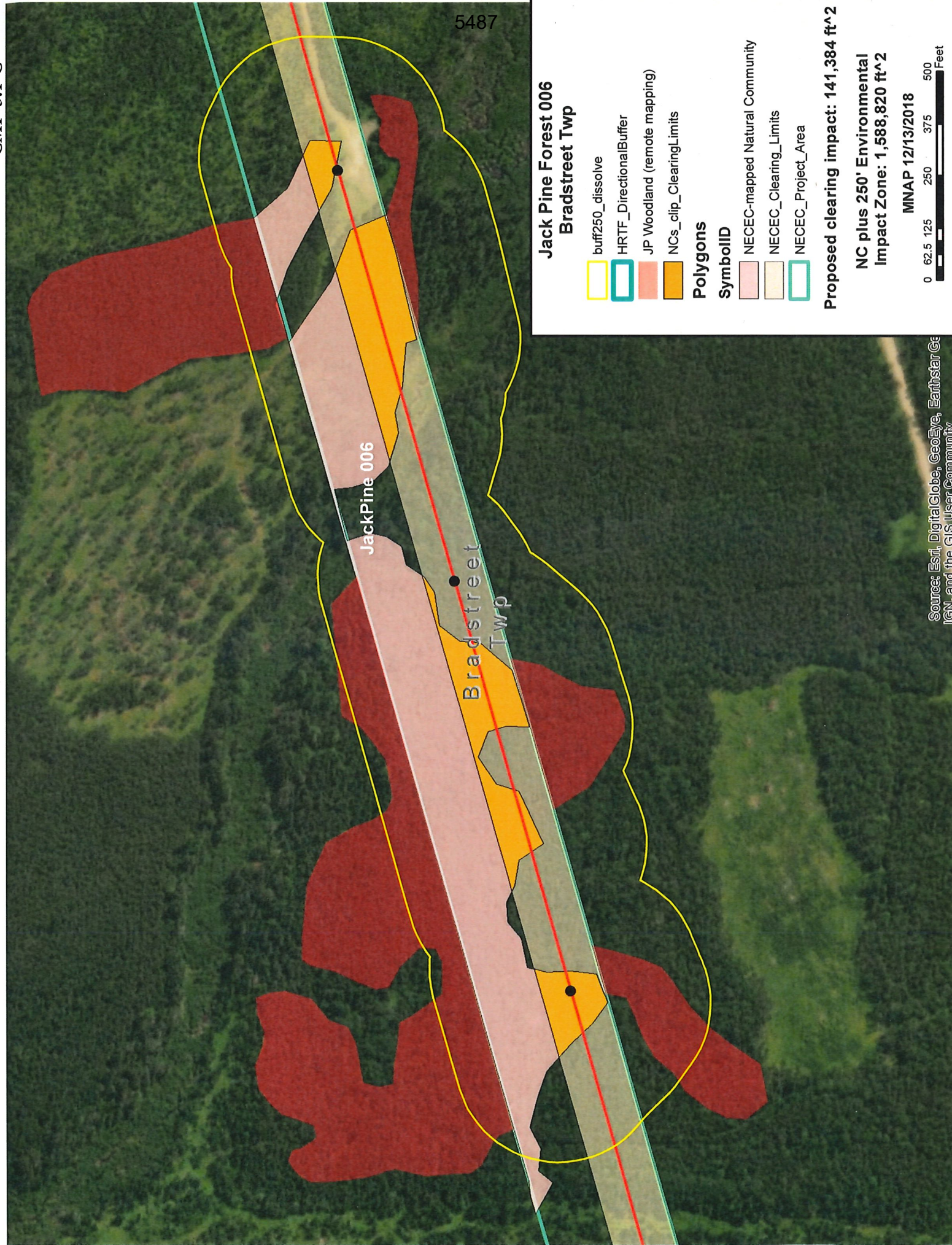


Date: 3/20/2019: Author: AW: Project: 144357

Date: 3/20/2019: Author: AW: Project: 144357







**Jack Pine Forest 006  
Bradstreet Twp**

- buff250\_dissolve
- HRTF\_DirectionalBuffer
- JP Woodland (remote mapping)
- NCs\_clip\_ClearingLimits

**Polygons**

**SymbolID**

- NECEC-mapped Natural Community
- NECEC\_Clearing\_Limits
- NECEC\_Project\_Area

**Proposed clearing impact: 141,384 ft<sup>2</sup>**

**NC plus 250' Environmental  
Impact Zone: 1,588,820 ft<sup>2</sup>**

**MNAP 12/13/2018**





# Jack Pine Forest 004 and 005 Bradstreet Twp

buff250\_dissolve

HRTF\_DirectionalBuffer

JP Woodland (remote mapping)

NCs\_clip\_ClearingLimits

## Polygons

### SymbolID

NECEC-mapped Natural Community

NECEC\_Clearing\_Limits

NECEC\_Project\_Area

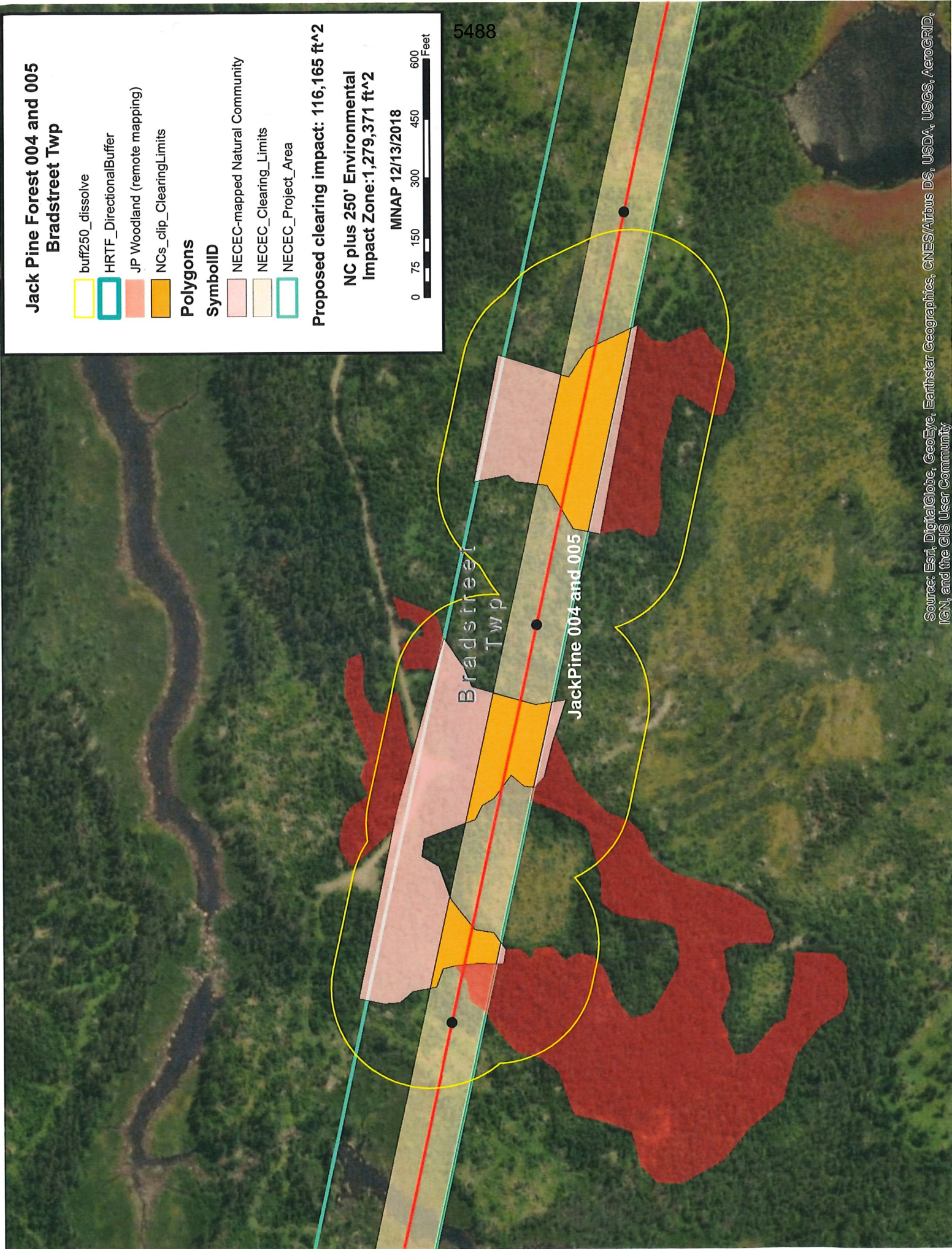
Proposed clearing impact: 116,165 ft<sup>2</sup>

NC plus 250' Environmental  
Impact Zone: 1,279,371 ft<sup>2</sup>

MNAP 12/13/2018



5488







STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED REBUTTAL TESTIMONY AND EXHIBITS OF  
LAUREN JOHNSTON

March 25, 2019

Regarding

- Issue 2: Wildlife Habitat and Fisheries: Brook Trout Habitat, Buffer Strips around Cold Water Fisheries
  - Responsive to Intervenor Group 4, witness Jeff Reardon
  - Responsive to Intervenor Group 4, witness Todd Towle
- Issue 4: Compensation and Mitigation – Cold Water Fisheries Habitat
  - Responsive to Intervenor Group 4, witness Jeff Reardon
  - Responsive to Intervenor Group 4, witness Ron Joseph
  - Responsive to Intervenor Group 4, witness Aram Calhoun
  - Responsive to Intervenor Group 6, Rob Wood, Andrew Cutco, Bryan Emerson

**I. Issue 2: Wildlife Habitat and Fisheries: Brook Trout Habitat, Buffer Strips around Cold Water Fisheries (Relevant to DEP Review)**

**Response to Intervenor Group 4 witness Jeff Reardon**

***NECEC Project meets the Standards for Brook Trout Habitat and Cold Water Fisheries***

Mr. Reardon asserts, citing only to a portion of the Maine Department of Environmental Protection (“DEP”) rules, that the application does not meet the Chapter 375 “standard” that “Proposed alterations and activities will not adversely affect wildlife and fisheries lifecycles,” particularly with respect to brook trout. He says that “The proposed mitigation to address these adverse effects on brook trout is not adequate.” However, the applicable standard under Chapter 375 is “whether the developer has made adequate provision for the protection of wildlife and fisheries” and, in making that determination, “the Department shall consider all relevant evidence to that effect, such as evidence that . . . Proposed alterations and activities will not adversely affect wildlife and fisheries lifecycles.”

The NECEC Project readily meets this standard for two reasons: (1) there will only be a de minimis impact to brook trout habitat; and (2) CMP addressed and incorporated the DEP’s and Maine Department of Inland Fisheries and Wildlife’s (DIFW’s) recommendations regarding fisheries habitat, to the satisfaction of those agencies.

First, CMP provided peer reviewed studies, specific to transmission line development and the indirect impacts of tree clearing on fisheries habitats, that demonstrate that projects like the NECEC Project will have a de minimis impact on brook trout fisheries. As discussed in the NECEC Compensation Plan and addressed in CMP witness Mark Goodwin’s direct testimony, potential indirect impacts to brook trout habitat include sedimentation and turbidity, introduction

of pollutants, and stream insolation. A study by N.C. Gleason<sup>1</sup> on the impacts of power line rights-of-way (“ROW”) on forested stream habitat found that despite the open canopy condition, water temperatures were slightly lower than in off-ROW areas and that none of the water quality parameters was significantly different between the on-ROW and off-ROW study areas.

Gleason’s study also found no correlation between percent canopy cover and mean percentage of fines and found no significant difference in the Benthic Index of Biotic Integrity scores between on-ROW and upstream areas. This study also stated that “it is likely that the streams intersected by rights-of-way have recovered from their initial disturbances.” It is therefore reasonable to conclude that impacts associated with construction activities are in fact temporary, and that vegetation will reestablish a natural regime, supported by CMP’s vegetation management practices and 100-foot riparian buffer protections.

Similarly, a study conducted by Peterson<sup>2</sup> on the effects of electric transmission line ROWs on trout in forested headwater streams in upstate New York found that stream reaches in electric transmission ROWs were exposed to more light, had denser stream bank vegetation, were deeper and narrower, and had a greater area composed of pools. Peterson’s study found that trout were more abundant in stream reaches within ROWs and concluded that the increase in incident sunshine resulted in a denser forb and shrub root mass, which further stabilized stream banks, resulting in less stream bank erosion, deeper channels, and higher populations of trout. Peterson concluded that electric transmission ROWs do not constitute an adverse effect on headwater trout population densities in forested basins.

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<sup>1</sup> Gleason, N.C. 2008. Impacts of Power Line Rights-of-Way on Forested Stream Habitat in Western Washington. Environmental Symposium in Rights-of-Way Management, 8th International Symposium, pages 665-678.

<sup>2</sup> Peterson, A.M. 1993. Effects of Electric Transmission Rights-of-Way on Trout in Forested Headwater Streams in New York. North American Journal of Fisheries Management, vol. 13 pp. 581-585.

According to DIFW,<sup>3</sup> “Maine supports the most extensive distribution and abundance of wild brook trout (*Salvelinus fontinalis*) in their native range within the United States; more than 1,200 lakes and ponds are managed for brook trout, of which approximately 60% are sustained by natural reproduction. In addition, brook trout occur in an estimated 22,248 miles of stream habitat, the vast majority of which are wild.” Maine has a healthy population of brook trout, which are found throughout the state, including in areas disturbed by development activities. Mr. Reardon’s Exhibit 4, which shows nearly the entire state of Maine as having intact sub-watersheds supporting brook trout populations despite the presence of human activity and disturbance on the landscape, provides evidence that not all human activity necessarily causes adverse impact to brook trout or their habitat, especially those that retain natural features.

Second, CMP addressed the recommendations of DEP and DIFW by incorporating additional minimization and compensation recommendations for brook trout habitat, and cold water fisheries generally, into the NECEC Project applications materials, vegetation management plans, and Compensation Plan. CMP did so despite the Project’s de minimis impact to brook trout fisheries.

As described in the application materials, CMP avoided in-stream work (proposing only temporary crossings that completely span the resources for the purpose of constructing the transmission line), expanded riparian buffers to 100 feet for cold water fisheries habitat, and proposed a robust Compensation Plan that includes habitat enhancement measures (e.g. a culvert replacement program), preservation of lands that contain cold water fishery habitat, and monetary compensation to the Maine Endangered and Nongame Wildlife Fund to be used at the discretion of DIFW for cold water fisheries habitat protection.

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<sup>3</sup> <https://www.maine.gov/ifw/fish-wildlife/fisheries/wild-brook-trout.html>



The avoidance, minimization and best management practices (“BMPs”) CMP proposed for cold water fisheries habitat on the NECEC Project go above and beyond prior accepted practices. For example, they are more restrictive than the proposal that DEP and the U.S. Army Corps of Engineers (“USACE”) approved in 2010 for the Maine Power Reliability Program (“MPRP”) to adequately protect fisheries. At the time, both agencies determined that indirect impacts of tree clearing; along with the avoidance measures (no in-stream work) and implementation of erosion and sedimentation control BMPs, would not adversely or unreasonably affect Atlantic salmon. Because DEP and USACE approved the minimization measures and best management practices for MPRP, and the United States Fish and Wildlife Service (“USFWS”) concluded that there would be no adverse effect to Atlantic salmon, it follows that the more restrictive minimization measures for the NECEC will adequately protect cold water fishery habitat and associated species. Notably, DEP did not require compensation for cold water fishery habitat impacts for the MPRP, despite clearing of riparian areas associated with both Atlantic salmon and brook trout.

The studies by Gleason and Peterson, the prior agency findings on the impact of electric transmission construction using similar but less restrictive best management practices on MPRP, and the avoidance and minimization measures and BMPs proposed for the NECEC Project all support the conclusion that construction of the NECEC will not unreasonably impact cold water fishery habitat or adversely affect Atlantic salmon or brook trout.

***The NECEC Project Addresses Mitigation for Atlantic Salmon***

Mr. Reardon asserts in multiple locations that “there is no discussion whatsoever of impacts to Atlantic salmon habitat, or mitigation of these impacts.” Atlantic salmon is discussed in the Site Law application. CMP has addressed Atlantic salmon impacts by avoiding in-stream

work for purposes of constructing the transmission line, minimizing the potential for pollution by maintaining a setback for equipment maintenance and refueling, mitigating indirect impacts by maintaining a 100-foot riparian buffer on Atlantic salmon streams, and implementing erosion and sedimentation control BMPs. In fact, CMP has proposed and will develop, and provide to DEP, site-specific erosion control plans for any structures to be located within stream buffers.

***NECEC Project Considered Alternatives and Mitigation Measures***

With regard to CMP's alternative route evaluation, Mr. Reardon contends on page 12 of his testimony that minor modifications to the route or to the size and location of the structures were not considered. This is inaccurate, as discussed by CMP witness Kenneth Freye in Section VI of his rebuttal testimony. Mr. Freye's rebuttal testimony discusses CMP's evaluation, and land acquisition availability, for each of the stream crossings Mr. Reardon expresses concern for, in particular Gold Brook-Rock Pond, Cold Stream, and Tomhegan Stream.

Furthermore, Mr. Reardon suggests that alternative measures, such as taller poles to maintain full height trees or avoiding the resources by horizontal directional drill ("HDD"), were not but should have been evaluated. He asserts at page 14 that "[i]f these alternatives were reasonable to protect particularly sensitive insect and salamander populations, they could have been used to protect particularly sensitive brook trout." The claim that taller poles were not evaluated is inaccurate. CMP consulted with DIFW beginning in May 2017, numerous times during development of the applications and in multiple consultation working sessions since the applications were filed in September 2017. CMP and DIFW reviewed an extensive list of priority resources, which were identified through DIFW's project review process and by CMP.

The Roaring Brook Mayfly ("RBM") and Northern Spring Salamander ("NSS"), are state threatened and state special concern species, respectively, and were considered for a higher level

of mitigation to protect fragile populations. DIFW recommended avoidance for a particular subset of these species, notably at Mountain Brook and Gold Brook, which surveys confirmed to have one or both RBM and NSS present. CMP agreed to install structures at Mountain Brook and Gold Brook that are tall enough to allow full-height vegetation within their 250-foot riparian buffer management zones at an incremental cost of \$1.9 million.

Brook trout is not a state or federally listed species, and according to DIFW maintain a healthy population in Maine. During CMP's consultations with DIFW, there were no resources or particular areas determined by DIFW to require taller vegetation to address brook trout or cold water fishery concerns.

Mr. Reardon contends at page 18 that a new crossing at the West Branch of the Sheepscot River will have "significant" impact. This section of the river is already impacted by a transmission line crossing and has long been an agricultural field, maintained by the landowner who has agricultural rights in the right-of-way. The 100-foot stream buffer along the river will be cleared of capable species, which are already sparse in this area, in accordance with CMP's Vegetation Construction Practices (Site Law, Exhibit 10-1), and non-capable and shrubby vegetation will be retained to the extent practicable. During its consultation with CMP, DIFW suggested that a buffer planting would be beneficial and would enhance the riparian buffer in this area. CMP provided a buffer planting plan to DIFW and DEP on January 9, 2019.

***NECEC Project Included Thorough Agency Consultation***

It is also inaccurate to describe CMP's consultations regarding brook trout presence "to have been left very late in the process." As described above, CMP's consultation with DIFW began in May 2017 during the application development process and included multiple consultation working sessions through 2018 and into early 2019. DIFW provided CMP with a

brook trout GIS data layer on July 12, 2017, prior to the application submission. Designated brook trout streams were incorporated into CMP's geodatabase and Site Law Exhibit 7-7 NECEC Waterbody Crossing Table (9/27/2017). In a January 22, 2019 meeting with DEP and DIFW, DIFW notified CMP that the GIS layer previously provided was incomplete and then provided a list of additional identified resources. CMP incorporated the additional resources into the January 30, 2019 Compensation Plan and Exhibit 7-7 NECEC Waterbody Crossing Table.

Mr. Reardon asserts that CMP has not reached agreement with DIFW on various issues, including identification of cold water fisheries and maintenance of buffers. Reardon direct at 20-21. Group 4 witness Ron Joseph inferred in his testimony that CMP's proposed compensation plan does not avoid or minimize impacts to the upper Kennebec River deer wintering area (DWA) to the satisfaction to DIFW guidelines. Joseph direct at 4-5. Mr. Reardon and Mr. Joseph are incorrect.

During the January 2019 meeting CMP, DEP, and DIFW discussed riparian buffer widths, protective measures and restrictions within those buffers for cold water fisheries. The agencies requested that to adequately protect cold water fishery habitat, CMP should apply 100-foot riparian buffers to all streams identified as brook trout habitat, in addition to the resources for which CMP had already agreed to an expanded buffer. In short, CMP agreed with DIFW, after a lengthy, detailed and collaborative consultation process, and made the requested changes to the applicable application documents.

This comprehensive consultation process has allowed DIFW to provide their final comments on the NECEC Project Compensation Plan, in response to a March 11, 2019 email and attachments from CMP requesting "that MDIFW confirm that the attached clarification materials address all of MDIFW's remaining concerns, and that MDIFW is satisfied that the



latest (January 30, 2019) NECEC Project Compensation Plan, as supplemented by these attached clarifications, provides satisfactory mitigation of the NECEC Project's impacts." In its March 18, 2019 response, DIFW thanked CMP "for the March 11 email as a follow-up to address the Department remaining resource impact concerns for the NECEC project," and noting DIFW's appreciation for CMP's "willingness to work with us to finalize the complex fish and wildlife resource issues." DIFW said that CMP's response and explanations were "sufficient to allow DEP to apply applicable natural resource law to the permitting process." The March 11 and 18, 2019 email exchanges, and the attachments to the March 11 email, are attached hereto as Exhibit CMP-4.1-A. This exchange demonstrates that Mr. Reardon and Mr. Joseph are wrong when they say that CMP has not adequately addressed DIFW's concerns.

One remaining housekeeping item is noted in DIFW's final comments. CMP mistakenly reported that Gold Brook only contains Roaring Brook Mayfly, when in fact Gold Brook contains both Roaring Brook Mayfly and Northern Spring Salamander. As noted by DIFW, however, this error did not affect the compensation calculations, but does require correction of Table 1-5.12 of the Compensation Plan. The corrected Table 1-5.12 is attached hereto as Exhibit CMP-4.1-B.

***NECEC Project Will Not Increase Risk of Invasive Fish Species to Beattie Pond***

With respect to the LUPC certification, Mr. Reardon says he is particularly "concerned that the NECEC corridor will become a pathway for motorized vehicles, including ATV's, and this increased motorized use around Beattie Pond will substantially increase the risk that invasive fish species become established in Beattie Pond, a designated State Heritage Fish Water for brook trout. Mr. Reardon is mistaken about the risk of increased ATV usage because access to

Beattie Pond is gated and controlled by the landowner, and CMP will reinforce this access control by blocking its transmission line ROW with gates or boulders.

#### **Response to Intervenor Group 4 witness Todd Towle**

Mr. Towle expresses his concern, at page 5, regarding adverse impacts to Gold Brook. Mr. Towle's comments disregard the taller structures CMP has proposed at Gold Brook to allow full height vegetation within its 250-foot riparian buffer management zone to protect the RBM and NSS; this will allow these species to utilize intact streamside vegetation for feeding and cover during their various life stages, thus avoiding and minimizing impacts to these species. This proposal will also protect brook trout and other cold water fishery species by avoiding and minimizing secondary impacts (tree clearing) within the riparian buffer.

## **II. Issue 4: Compensation and Mitigation – Cold Water Fisheries Habitat (Relevant to DEP Review)**

#### **Response to Intervenor Group 4 witness Jeff Reardon**

Mr. Reardon incorrectly states at pages 9-10 of his testimony that the January 30, 2019 Compensation Plan “contains little information regarding brook trout” and that “there is no actual assessment of the impacts to cold water fisheries habitat, of the appropriate scale of mitigation, nor of the cold water fisheries values to be protected, restored, or enhanced by the Compensation Plan.”

The NECEC Potential Compensation Tracts - Natural Resources Survey Results (Exhibit 1-9 of the Compensation Plan) do indeed include assessments of the functions and values of each parcel, including discussions of fisheries habitats. According to the survey results, the parcels proposed for the purposes of cold water fisheries impact mitigation, which are located on the

Dead River, contain perennial and intermittent feeder streams that support known brook trout populations.

Furthermore, although tree clearing for transmission lines does not adversely impact cold water fisheries habitat, CMP worked with DEP and DIFW to determine appropriate and practical compensatory mitigation for impacts to cold water fisheries that cannot be otherwise avoided or mitigated. During the application process, CMP responded to the guidance provided by DEP and DIFW and provided a robust, multifaceted Compensation Plan that uses various compensation tools as mitigation for cold water fishery impacts. CMP worked closely with those agencies to determine the appropriate mitigation for these impacts and incorporated their recommendations into its proposal.

Nevertheless, Mr. Reardon alleges at pages 23-24 that \$200,000 is not sufficient to replace approximately 20-35 culverts. The significance of this commitment is the amount of cold water fisheries habitat connectivity that can be achieved, not the number of culverts whose replacement it will fund. CMP has committed to working with DIFW and cooperating non-governmental organizations (“NGOs”) to conduct a qualitative assessment to determine the most beneficial use of the proposed funding, prior to choosing which projects to undertake. For example, if two or three culvert replacement projects reconnect a larger area of viable cold water fisheries habitat than 20 smaller projects, then it may be better to choose the smaller quantity of qualitatively greater culvert replacements. The program was designed to be flexible because the identification of specific culverts to be replaced, i.e., identification of culverts with the greatest habitat re-connectivity potential, has not yet taken place.

Mr. Reardon asserts at page 21 of his testimony that “Nowhere within the clearing limits of the ROW will there be the mature trees and full canopy closure that are required to provide the

most important buffer functions for brook trout habitat: shading, recruitment of organic matter and large woody debris, and bank stabilization.” This assertion is incorrect. In fact, as noted in the studies cited above, water temperatures have been found to be lower in some cleared runs of streams within rights of way. Organic matter and moderate sized woody debris will be contributed to streams from dense riparian zone herbaceous and woody non-capable vegetation that will remain and will be maintained on the NECEC Project right of way after construction. Further, as also noted in the studies cited earlier, increased insolation in riparian zones cleared of tall trees increases stream bank vegetation and improves stream bank stabilization.

Finally, Mr. Reardon asserts at pages 24-25 of his testimony that the \$180,000 contribution to the Maine Endangered and Nongame and Wildlife Fund, a contribution to be directed to this fund at the request of DIFW, is inadequate. Early versions of CMP’s Compensation Plan proposed to implement “chop and drop” wood addition for the enhancement of cold water fisheries habitat. DIFW indicated that this enhancement proposal was not preferred as a mitigation measure and alternatively recommended a monetary contribution to the Maine’s Non-Game Wildlife Fund. The contribution to this fund will allow DIFW to use this discretionary money for priority projects related to fisheries habitat conservation and/or aquatic passage. DIFW has indicated that this monetary fund contribution is adequate, and CMP trusts that it will be thoughtfully and effectively used by DIFW for cold water fishery habitat enhancement.

#### **Response to Intervenor Group 4, witness Aram Calhoun**

Dr. Calhoun states, “A small subset of the 700 potential pools identified on the ROW are included in the compensation calculations.” And, “The Army Corps of Engineers compensation



dollars are based on a square footage estimate of impact times a multiplier based on value. Square footage of impact is not a measure of ecological impact and the ratings of H, M, and L are not based on scientifically defensible science.” Dr. Calhoun’s testimony that relates to Army Corps jurisdictional wetlands are not relevant to DEP’s review; although CMP has fully compensated for both DEP-jurisdictional and Corps-jurisdictional vernal pool impacts, addressing Corps-jurisdictional impacts is beyond the scope of this proceeding.

Dr. Calhoun attempts to cast doubt on the appropriateness of CMP’s use of a 60% adjustment applied to permanent cover type conversion impact (tree clearing) within significant vernal pool habitat. This adjustment was explicitly allowed by DEP in a letter from Michael Mullen, dated April 25, 2017: “During the course of permitting for the Maine Power Reliability Program project, the Department determined in consultation with the Department of Inland Fisheries and Wildlife that impacts to SVPs resulting solely from vegetation conversion from forested to scrub/shrub could be compensated for at a rate of less than 100%. During that project, the Department determined that compensation at a rate of 60% of that required by Chapter 310 Wetlands and Waterbodies Protection rules and the Department’s In-Lieu Fee Compensation Program, would be adequate to offset the loss in functions and values to SVPs for vegetation conversion only. . . . The Department will continue to assess the compensation at a rate of 60% for vegetation conversion within transmission line corridors....” (See Exhibit 1-2 of CMP’s Compensation Plan.) The NECEC’s standards and restrictions for significant wildlife habitat (Exhibit 10-1 VCP and 10-2 VMP) are consistent with standards approved for previous projects, when the 60% adjustment was approved.

Further, Dr. Calhoun states that “The mitigation only compensates for direct impacts to vernal pools that have regulatory or legal status--- a small subset of the overall impacts to pools.

There is no compensation for fragmentation in the form of interruption of migration and dispersal routes, connections among pools, and connections from breeding to post breeding habitats. Therefore, I do not believe that this project meets the no unreasonable adverse impact standard. Its impacts are severe and the applicant's mitigation proposal is inadequate.” Dr. Calhoun is incorrect in her statement that CMP’s compensation plan “only compensates for direct impacts.” The compensation plan includes in-lieu fee (ILF) contributions for both direct (fill) and indirect (tree clearing) impacts to significant vernal pools and their 250-foot critical terrestrial habitat.

The ILF Program (see DEP Fact Sheet – In Lieu Fee Compensation Program (2017)) defines compensation rates and multipliers for compensation for significant vernal pool impacts. CMP applied the appropriate value according to the current (August 2017 to December 2019) DEP ILF Fact Sheet. Additionally, as discussed previously, CMP applied a 60% adjustment for cover type conversion to compensate for a partial loss of habitat associated with tree clearing, as allowed by DEP.

In summary, all direct and indirect impacts to DEP-jurisdictional vernal pools have been appropriately compensated for consistent with DEP and DIFW guidance and formula. This conclusion is further supported by the DIFW communication of March 18, 2019 noted above, which stated in part, that CMP has “address[ed] the Department’s remaining resource impact concerns for the NECEC project.”

#### **Response to Intervenor Group 6 witnesses Rob Wood, Andrew Cutco, Bryan Emerson**

Part III of The Nature Conservancy’s (“TNC”) testimony addresses the NECEC’s compensation and mitigation for cold water fisheries habitat. TNC recognizes the benefits of

replacing undersized culverts using Stream Smart principals to improve habitat connectivity, as proposed in CMP's Culvert Replacement Program. An issue similarly raised by Jeff Reardon, Trout Unlimited (Group 4), contends that the proposed funding of \$200,000 is not sufficient to replace 20-35 culverts. As noted above, CMP's culvert quantity range was based on a cost estimate for replacement of typical sized culverts that could be funded with this contribution amount, however it is not the quantity itself that is important, but the habitat re-connectivity results and benefits. CMP is committed to working with DIFW and cooperating NGOs to conduct a qualitative assessment of potential culvert replacement projects and to determine the most beneficial use of funding, prior to choosing which projects to undertake.

TNC's testimony requests that CMP consider DIFW's recommendation to maintain a 100-foot riparian buffer on all streams within the Project Area, in considering cold water fisheries habitat protection. CMP in fact modified its proposal in its January 30, 2019 submission of updated application materials by expanding the buffer to 100 feet for cold water fisheries habitat (i.e., known brook trout streams and Atlantic salmon streams), in addition to the protective measures and restrictions previously proposed. For all other streams a 75-foot buffer is proposed (expanded from a previous proposal of 25 feet). This recommendation was made by DEP and DIFW in a consultation meeting on January 22, 2019 and subsequently incorporated in the application materials submitted on January 30, 2019. As noted above, DIFW has determined that CMP has addressed its remaining resource impact concerns including, presumably, coldwater fisheries water quality and the adequacy of the proposed buffers to maintain and protect this resource.

**III. Conclusion (Relevant to DEP Review)**

CMP has taken the appropriate steps to avoid, minimize, and mitigate impacts to wildlife and fisheries and, where impacts could not be further mitigated, suitable compensation is proposed.

**Exhibits**

CMP-4.1-A MDIFW Final Review Comments and Exhibits 3/18/2019

CMP-4.1-B Compensation Plan Table 1-5.12 Revised 3/20/19



Dated: 3/19/19

Respectfully submitted,

Lauren Johnston  
Lauren Johnston

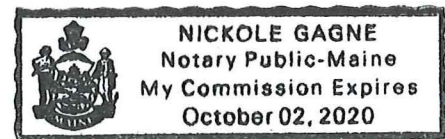
STATE OF MAINE  
CUMBERLAND, ss.  
COUNTY

The above-named Lauren Johnston did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Before,

Dated: 3/19/19

Nickole Gagne  
Notary Public

Name: NICKOLE GAGNEMy Commission Expires: 10/2/2020



**Beyer, Jim R**

---

**From:** Connolly, James  
**Sent:** Monday, March 18, 2019 3:13 PM  
**To:** gerry.mirabile@cmpco.com  
**Cc:** Beyer, Jim R; Peabody, Timothy E; Stratton, Robert D  
**Subject:** FW: NECEC 12-21-18  
**Attachments:** Original 6 Comp parcels, Summary of Encumbrances.xlsx; Additional Com parcels, Summary of Encumbrances.xlsx; SOM License Moxie Stream.pdf; S27001.10 Grand Falls, Weyerhaeuser and CMP Reciprocal Access Easement A....pdf; DOC Master License 2011-01-04.pdf; CMP to Western Mountains Charitable Foundation, Trail Agreement, 2008-3-....pdf; 2019-03-11 Responses to MDIFW Questions.docx; 2019-03-10 Compensation Parcels Encumbrance Agreements Summary.docx

Gerry,

Thanks for the March 11 email as a follow-up to address the Department remaining resource impact concerns for the NECEC project. We appreciate your willingness to work with us to finalize the complex fish and wildlife resource issues. We have read your response and accept the explanations provided in the March 11 email as sufficient to allow DEP to apply applicable natural resource law to the permitting process. We would call out one miscommunication on page 7 regarding Roaring Brook Mayfly. The issue we desired to call attention to was the presence of Northern Spring Salamander in Gold Brook in addition to the Roaring Brook Mayfly. The following comment from Department Biologist Beth Swartz prompted our request for full canopy over Gold Brook.

***"Gold Brook/unnamed tributaries to Gold Brook: During RBM surveys at this site, Northern Spring Salamander was documented in Gold Brook via photograph in the applicant's final report. Impact and compensation calculations for this site need to acknowledge presence of both species".***

Including the presence of Northern Spring Salamander in the January 30, 2019 Compensation Plan, Table 1-5.12 ,for Gold Brook and Tributaries would be appreciated, the compensation has been calculated correctly.

I understand you are under a time constraint so I am responding on behalf of Bob Stratton who was away today and unable to provide the response requested.

For those cc-ed other than Gerry I am forwarding separately the second accompanying email from Gerry to complete the communication.

Jim

---

**From:** Mirabile, Gerry J. [mailto:Gerry.Mirabile@cmpco.com]  
**Sent:** Monday, March 11, 2019 2:54 PM  
**To:** Stratton, Robert D <Robert.D.Stratton@maine.gov>  
**Cc:** Peabody, Timothy E <Timothy.E.Peabody@maine.gov>; Connolly, James <James.Connolly@maine.gov>; Camuso, Judy <Judy.Camuso@maine.gov>; Matt Manahan <mmanahan@pierceatwood.com>  
**Subject:** RE: NECEC 12-21-18

**EXTERNAL: This email originated from outside of the State of Maine Mail System. Do not click links or open attachments unless you recognize the sender and know the content is safe.**

Bob –

Thank you for identifying remaining MDIFW resource issues in your December 21 email below, and for working with CMP to resolve these issues. Attached is a summary of those remaining issues, their resolution, and where you can find documentation of those resolutions. We have also included clarifications regarding MDIFW-related issues arising from our January 30, 2019 compensation plan and related discussions. **[Note: due to email file size limitations, the remaining 3 compensation tracts encumbrance documents will be sent in a separate email.]**

To ensure we are all on the same page, CMP requests that MDIFW confirm that the attached clarification materials address all of MDIFW's remaining concerns, and that MDIFW is satisfied that the latest (January 30, 2019) NECEC Project Compensation Plan, as supplemented by these attached clarifications, provides satisfactory mitigation of the NECEC Project's impacts.

Thank you for your continued assistance.



**Gerry J. Mirabile**  
**Manager – NECEC Permitting**  
**AVANGRID Networks, Inc.**  
 83 Edison Drive, Augusta, ME 04336  
 Office 207-629-9717  
 Cell 207-242-1682  
[gerry.mirabile@cmpco.com](mailto:gerry.mirabile@cmpco.com)

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**From:** Stratton, Robert D [<mailto:Robert.D.Stratton@maine.gov>]  
**Sent:** Friday, December 21, 2018 2:49 PM  
**To:** Mirabile, Gerry J.  
**Cc:** Peabody, Timothy E; Connolly, James; Camuso, Judy; Matt Manahan; Beyer, Jim R  
**Subject:** NECEC 12-21-18

Dear Gerry,

MDIFW appreciates the time and effort you have spent with us preparing the compensation plan for this project. As we finalize our assessment of the NECEC project, I refer to my email of 12/7/18, in which I indicated that MDIFW has additional issues to review and verify. The December 7 Compensation Plan and supporting documents appear to provide closure on most of the issues under review by MDIFW. We have appreciated your willingness to work with us to resolve them. The items below are the remaining issues currently under review by department staff for verification. We look forward to closure of these as soon as practical.

1. MDIFW is reviewing and verifying available spatial and numerical data that was used to calculate totals related to natural resource impact areas for assessing mitigation needs. The data provided and the details in the

compensation plan have allowed MDIFW to concur with your compensation for deer wintering areas. We are still verifying the impact areas on the following resources to assess appropriate compensation. We look forward to your assistance in finalizing any questions that may arise.

- a. Perennial and Intermittent Stream Buffers.
  - b. IWWH
  - c. RBMF/NSS
  - d. RTE and SC Species
  - e. SVP
2. The discussion of Cold Stream, 3 Significant Vernal Pools (SVPs) and their Critical Terrestrial Habitats needs to be finalized. In previous discussions CMP indicated that a portion of an abandoned road in proximity will be removed and that another portion is currently revegetating with alder. To resolve this MDIFW staff will review the photographs of the regenerating area that you have provided to determine if further plantings are necessary. MDIFW looks forward to reviewing these materials to bring this issue to completion.
  3. MDIFW and CMP agreed to evaluate all riparian areas post-construction and assess the need to augment the natural regrowth of vegetation within the respective buffers. As part of the post construction assessment MDIFW requests that the five streams labeled as PSTR-44-01, 44-01, 45-03, 44-06, 44-07 (kmz pin 12) receive a higher level of consideration for potential plantings as they have elevated value as stream resources. MDIFW does request that CMP provide additional planting plans during this phase of the project for the resources listed below.
    - a. Sheepscot River where Brook Floaters are present
    - b. Montsweag Brook where Brook Floaters are present
  4. MDIFW requests CMP provide easement language and any other encumbrances against preservation properties that have been offered as mitigation to impacted resources. We are assuming no further easements will be placed on the properties once we receive that documentation.

We appreciate your assistance in helping us resolve these remaining issues!

**Bob Stratton**

**Environmental Program Manager**

**Fisheries and Wildlife Program Support Section Supervisor**

Maine Department of Inland Fisheries & Wildlife

284 State Street; 41 State House Station

Augusta, Maine 04333-0041

Tel: (207) 287-5659; Cell: (207) 592-5446

[mefishwildlife.com](http://mefishwildlife.com)

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**Responses to MDIFW Remaining Issues from December 21, 2018 MDIFW email and Clarification Regarding January 30, 2019 Compensation Plan  
March 11, 2019**

**Issue 1**

MDIFW is reviewing and verifying available spatial and numerical data that was used to calculate totals related to natural resource impact areas for assessing mitigation needs. The data provided and the details in the compensation plan have allowed MDIFW to concur with your compensation for deer wintering areas. We are still verifying the impact areas on the following resources to assess appropriate compensation. We look forward to your assistance in finalizing any questions that may arise.

- a. Perennial and Intermittent Stream Buffers.
- b. IWWH
- c. RBMF/NSS
- d. RTE and SC Species
- e. SVP

**Issue 1 Resolution**

CMP verified and updated impact areas for all of the above resources, recalculated and reconsidered in-lieu fees and other compensation measures for these resources, and incorporated updated impact areas and associated updated compensation in its January 30, 2019 Compensation Plan, submitted to MDIFW and other parties.

**Issue 2**

The discussion of Cold Stream, 3 Significant Vernal Pools (SVPs) and their Critical Terrestrial Habitats needs to be finalized. In previous discussions CMP indicated that a portion of an abandoned road in proximity will be removed and that another portion is currently revegetating with alder. To resolve this MDIFW staff will review the photographs of the regenerating area that you have provided to determine if further plantings are necessary. MDIFW looks forward to reviewing these materials to bring this issue to completion.

**Issue 2 Resolution**

It is our understanding that after reviewing the photos of the regenerating area and the other information contained in Matt Manahan's December 21, 2018 email to you, MDIFW agrees that further plantings are not necessary.

**Issue 3**

MDIFW and CMP agreed to evaluate all riparian areas post-construction and assess the need to augment the natural regrowth of vegetation within the respective buffers. As part of the

post construction assessment MDIFW requests that the five streams labeled as PSTR-44-01, 44-01, 45-03, 44-06, 44-07 (kmz pin 12) receive a higher level of consideration for potential plantings as they have elevated value as stream resources. MDIFW does request that CMP provide additional planting plans during this phase of the project for the resources listed below.

- a. Sheepscot River where Brook Floaters are present
- b. Montsweag Book where Brook Floaters are present

### **Issue 3 Resolution**

The statement that “CMP agreed to evaluate all riparian areas post-construction and assess the need to augment the natural regrowth of vegetation with the respective buffers” was inaccurate, and has been clarified, as discussed below.

In consultation meetings, one stream complex, PSTR-44-01, 44-01, 45-03, 44-06, 44-07 (kmz pin 12), known as Tomhegan Stream, was discussed and CMP agreed to revisit these areas with MDIFW following construction to determine if plantings were warranted. It was also discussed in the course of these consultation meetings that plantings of non-capable species in stream buffers, particularly in this area of the Project where soils are rocky, may not succeed, and that natural revegetation is likely to out-compete plantings.

After this discussion MDIFW requested that CMP propose planting plans for the West Branch of the Sheepscot River and Montsweag Brook because of the documented presence of the Brook Floater, a State-threatened freshwater mussel. CMP has proposed additional protections for Tomhegan Stream by implementing an expanded 100-foot buffer, which will minimize impact to the riparian area during construction and will allow the natural revegetation and re-establishment of non-capable vegetation, consistent with the VCP and VMP.

In email correspondence on 1/8/2019, Bob Stratton indicated that “brook floaters are present in the Sheepscot River, but are not known to occur in Montsweag Brook. Though Montsweag Brook is a valuable resource, recent communications have incorrectly included it as a resource for this mussel species.” Gerry Mirabile responded on 1/8/2019 via email, “now that MDIFW has determined that the Brook Floater mussel is not known to occur in Montsweag Brook, CMP does not intend to provide a buffer planting plan for Montsweag Brook (we will provide a planting plan for the Sheepscot in the near future).”

The planting plan for the West Branch of the Sheepscot River was provided to MDIFW and MDEP on 1/9/2019. See MDEP web link: [2019-01-09 WEST BRANCH SHEEPCOT PLANTING.pdf](#)

### **Issue 4**

MDIFW requests CMP provide easement language and any other encumbrances against preservation properties that have been offered as mitigation to impacted resources. We are

assuming no further easements will be placed on the properties once we receive that documentation.

#### **Issue 4 Resolution**

CMP provided the requested information on the 7 proposed preservation tracts within the upper Kennebec deer wintering area by email to you and others on January 8, 2019, 8:00 pm. CMP provided this same information for the original 6 offered compensation tracts by email to you and others on January 11, 2019, 6:06 pm.

#### **Brook Trout – Capable Vegetation**

Bob Stratton’s email of January 24, 2019 4:16 pm regarding NECEC brook trout resources states as follows: “This opinion is based on CMP’s plan to allow capable vegetation within the ROW to attain heights of up to approximately 10-feet, and higher as conditions allow.” To clarify, CMP’s plan is that where terrain conditions permit (e.g., ravines and narrow valleys) capable vegetation will be permitted to grow within and adjacent to protected natural resources or critical habitats where maximum heights are expected to remain well below the conductor safety zone.

#### **Stream Buffers**

- **Does the VMP reflect changes in the Compensation Plan? If not, need to update.**

Yes, Exhibit 10-1 VCP (Section 4.0) and Exhibit 10-2 VMP (pages 6-7) submitted on January 30, 2019, reflect the expanded stream buffers recommended as a result of the CMP, MDEP, and MDIFW January 22, 2019 meeting.

MDEP web links for revised plans:

[2019-1-30 NECEC Site Law Exhibit 10-1 \(Revised\).pdf](#)

[2019-1-30 NECEC Site Law Exhibit 10-2 \(Revised\).pdf](#)

- **Confirm that 100’ buffers will be maintained for streams in compensation tracts.**

This is not necessary. The compensation tracts are proposed for preservation and will be placed in conservation using the MDEP Declaration of Covenants and Restrictions (DOCR) template to be recorded prior to the start of construction activities (see Section 1.2.2 of January 30, 2019 NECEC Compensation Plan). No “work” or impact to stream buffers is proposed or can occur with the DOCR in place. Note that invasive species control is proposed for the Little Jimmie Pond-Harwood Tract (Manchester), but that work will not affect protections afforded to stream buffers. (See 1.2.2.2 of the NECEC Compensation Plan).

MDEP web link: [2019-01-30 NECEC Compensation Plan final.pdf](#)

- **Quantify stream lengths and stream buffer areas in Grand Falls, Lower Enchanted, and Basin parcels.**

Please refer to Table 8-2 of the NECEC Compensation Parcels Natural Resource Surveys Report (Exhibit 1-9 of the January 30, 2019 NECEC Compensation Plan), summarized here:

| <b>Tract</b>       | <b>Linear<br/>feet/miles</b> |
|--------------------|------------------------------|
| Grand Falls        | 5,610 ft / 1.06<br>mi        |
| Lower<br>Enchanted | 22,620 ft / 4.28<br>mi       |
| Basin              | 35,210 ft / 6.67<br>mi       |

CMP quantified the total stream linear length on the compensation parcels, as discussed in the January 22, 2019 meeting with CMP, MDEP, and MDIFW. Quantifying the buffer area was also discussed, but MDEP instructed CMP to quantify streams by linear length to serve as the comparison between project impacts and the compensation offered.

## **IWWH**

- **Provide 25' buffer for herbicide application from wetlands within IWWH.**

See Exhibit 10-1 VCP Section 6.1.d, which states: “No herbicide use is permitted within 25 feet of any wetland within the mapped IWWH.”

- **Specify that spot herbicide spraying (vs. broadcast spraying) will be done.**

Please refer to Exhibit 10-1 VCP, Section 2.2.m, which states “Herbicide application is done by personnel with low-volume, hand-pressurized (manual) backpacks with appropriate nozzles, to minimize drift, who travel along the transmission line corridor by foot or by all-terrain vehicle and spot treat target specimens.”

Additionally, please refer to Exhibit 10-2 VMP, pages 3-4: “Direct application to individual plant species, as opposed to broadcast spray, will control the targeted woody vegetation allowing low-growing plant communities (the desired shrub and herbaceous species) to thrive....Aerial application will not be used.”

These restrictions apply globally within all habitat types.

- **Exhibit 10-1 VCP, Section 6.d and Exhibit 10-2 VMP-related section, note herbicide setback of 25' for IWWH. Verify spot-spraying.**

See Exhibit 10-1 VCP, Section 6.1.d: “No herbicide use is permitted within 25 feet of any wetland within the mapped IWWH.”

See Exhibit 10-2 VMP, page 9: “No herbicide use is permitted within 25 feet of any wetland within the mapped IWWH.”

See Exhibit 10-1 VCP, Section 2.2.m and Exhibit 10-2 VMP, pages 3-4, regarding spot spraying (also noted above).

These restrictions apply globally within all habitat types.



### Freshwater Wetlands

- **Table 1-1 (57 acres, 440.29 acres), Exhibit 1-4, discrepancy between compensation acreages in Musson Report, and Power report (510.75 acres). Verify and correct as needed.**

The Musson Report (8/10/17), prepared for the USACE for their consideration of the proposed compensation parcels pursuant to 33 C.F.R § 332.3(h), relied on preliminary data contained in Power Engineers' natural resource survey results. The NECEC Potential Compensation Tracts Natural Resources Survey Results Report (8/13/2017) further refined the acreages based on the survey results utilizing GPS data. The Power Engineers Report is the superseding document and a correction to the Musson report is not necessary.

There is no discrepancy between the Compensation Plan Table 1-1, Exhibit 1-4, and the Power Engineers Report. While the preservation parcels contain 510.75 acres of wetlands to be used for wetland preservation, only 497.30 acres of wetland preservation were required to offset permanent fill in wetlands (WOSS and non-WOSS), temporary wetland fill in PSS, and permanent forested wetland conversion impacts. This required compensation amount was determined using the appropriate compensation ratios and adjustments. There was an excess of 13.45 acres provided by the three compensation tracts (FLT, LJPT, PPT). This is described in Exhibit 1-4.

Table 1-1 notes that 57.01 acres of wetland preservation will be used to offset temporary wetland fill (in PSS) and 440.29 acres will be used to offset permanent fill in wetlands (WOSS and non-WOSS) and permanent forested wetland conversion, for a total of 497.30 acres, which is the total acreage required to compensate for wetland impacts.

### SVPs

- **Exhibit 7-5, discrepancies between manual totals and “cumulative” totals (31,606 vs. 31,370) – due to rounding? Verify which is correct; check all columns for same issue.**

The “manual totals” (i.e., summation of the columns) are not represented in the Cumulative Impacts section of Exhibit 7-5 and are not intended to be. See *Footnote 4: Cumulative Impacts are calculated by dissolving overlapping polygon areas*. In other words, the summation of the column sums each individual SVPH impact, while the Cumulative Impact portion of the table removes the overlapping buffer areas, thereby avoiding counting twice for an impact in the same location. This issue was discussed in the January 22, 2019 meeting with MDEP and MDIFW, and MDEP agreed this was the appropriate method to calculate impacts to SVPH.

- **Exhibit 10-1 (VCP) 250' buffers vs. Exhibit 10-2 (VMP) 100' buffers. Verify which is correct (or explain rationale for difference).**

Both are correct.

Exhibit 10-1, the Construction Vegetation Clearing Plan (VCP), applies to construction of the NECEC project. The 250-foot buffer, measured from the SVP depression, is intended to offer additional protections to these resources during construction, which is a more intensive management period, with the primary concern being tree clearing. During construction, vegetation clearing of capable species will be completed primarily with mechanical equipment, including motorized equipment. As such, CMP has incorporated expanded protections for SVPs by proposing a 250-foot buffer. Mechanized equipment will not be allowed in the pool depression and hand-cutting will be the preferred method of vegetation clearing within the SVP including its 250-foot critical terrestrial habitat or buffer. Mechanized equipment may be used in certain instances, specifically during frozen conditions or when matted travel lanes and reach-in techniques are implemented. Between April 1 and June 30, no vegetation removal using tracked or wheeled equipment will be performed within the 250-foot buffer. Additionally, no refueling or equipment maintenance will be allowed in these areas, unless done on a public access road.

Exhibit 10-2, the Post-Construction Vegetation Maintenance Plan (VMP), applies to the routine vegetation maintenance requirements within the NECEC transmission line corridors. While providing similar protections to SVPs as the VCP (please refer to exhibits 10-1 and 10-2 for a detailed description of the applicable restrictions), routine vegetation maintenance is a significantly less intensive activity and uses a combination of hand-cutting and selective herbicide applications, typically on a 4-year cycle. Personnel will travel along the transmission line corridor by foot or by all-terrain vehicles (ATVs) and spot-treat target species and specimens with approved herbicides and application methods. In some cases, hand tools (e.g., chain saws) may be used, but typically no heavy logging equipment is necessary because vegetation within the corridor will be younger and smaller, and so will already be controlled.

The activities that will occur during construction of the NECEC and during the post-construction vegetation maintenance cycles are quite different, so additional restrictions within a 250-foot buffer during construction are warranted while a 100-foot buffer is appropriate to protect these resources during post-construction routine vegetation maintenance.

- **Verify and reiterate spot herbicide application vs. broadcast in vicinity of vernal pools.**

See Exhibit 10-1 VCP, Section 2.2.m and Exhibit 10-2 VMP, pages 3-4, regarding spot spraying (also noted above). These restrictions apply globally to all habitat types.

- **Verify 25-foot setback of herbicides from pool depression.**

See Exhibit 10-1 VCP, Section 5.1.e: “No herbicide use is permitted within 25 feet of the SVP pool depression.”

See Exhibit 10-2 VMP, page 9: “No herbicide use is permitted within 25 feet of the SVP pool depression.”

### **Roaring Brook Mayfly**

- **VMP and compensation plan erroneously state that both Gold and Mountain Brook contain RBM – correct this.**

This is not erroneous, because they both contain RBM. Please refer to the NECEC Roaring Brook Mayfly and Northern Spring Salamander Survey Results, submitted to MDEP and MDIFW on October 19, 2018, pages 2-3: “RBM was confirmed as present in Mountain Brook (Johnson Mtn Twp) and Gold Brook (Appleton Twp).”

MDEP web link: [9.4 AIR Attachment F RBM and NSS Survey Results.pdf](#)

This report documents, though, that NSS was discovered in Mountain Brook, and not Gold Brook (page 3).

The results of the survey report submitted on October 19, 2018 are consistent with the January 30, 2019 Compensation Plan, VCP and VMP.

- **Calculations of tributary to Bog Brook has not been updated; IFW calculated 3.13 acres, CMP calculated 1.9 acres. Which is correct?**

The clearing impact within the management area of Tributary to Bog Brook (PSTR-12-07) is 1.9 acres. This is the forested area within the mapped management area polygon. The remainder of this management area is devoid of trees.

The following shapefiles were used to arrive at this result:

NECEC\_RBM\_and\_Salamander\_250\_area\_2018\_11.29.shp

NECEC\_RBM\_and\_Salamander\_water\_feature\_area\_2018\_11.29.shp

Clearing\_Limits.shp

Forest\_Area.shp

Supporting files can be accessed at the MDEP Web link: [Shapefiles\\_01\\_30\\_2019.](#)

### **RTE Species**

- **CMP agreed in writing to April 20 to June 30 (Rusty Blackbird?) as a no cut period - should be included in VCP and VMP.**

For the Rusty blackbird, CMP agreed in writing in its September 27, 2017 Site Law Application Section 7.4.4.8 “To avoid impacts during the breeding season, the NECEC will avoid clearing activities within the mapped polygon associated with the documented occurrence, as shown on the Natural Resources Maps (Attachment 2) during the nesting season (April 30 through June 30).” This commitment was reiterated in CMP’s response to MDIFW’s 6/29/2018 review comments and again in several consultation meetings with MDIFW. This commitment has not been incorporated into the VCP or VMP, but incorporation into those plans is not necessary because it is part of the MDEP record and CMP will be bound by it.

For the Bicknell's Thrush, in Site Law Application Section 7.4.4.7, CMP committed to "avoid impacts during construction within the Bicknell's thrush habitat, as shown on the Natural Resources Maps (Attachment 2), during the nesting and fledging periods (June 1 through August 15)." Again, this commitment has not been incorporated into the VCP or VMP, but it is part of the MDEP record and CMP will be bound by it.

These time of year restrictions have been incorporated into documents provided to the construction contract bidders as part of the NECEC request for proposals. Further, the granting of a permit by the MDEP will be dependent upon the proposals and plans and supporting documentation submitted by CMP during the application process. CMP will incorporate these restrictions into the VCP and VMP prior to construction.

- **CMP agreed in writing to providing written reports to MDIFW & MDEP - should be in VCP and VMP.**

For the Northern Bog Lemming, CMP agreed to conduct preliminary surveys for suitable habitat conditions and provide those results to MDIFW. CMP conducted surveys in a 1.5-mile survey area identified by MDIFW and determined that the survey area did not contain potential habitat for the Northern Bog Lemming. CMP provided those results to MDIFW on August 9, 2018.

MDEP web link: [2018-08-09 NECEC RBM NBL Habitat Survey Results.pdf](#).

For the Roaring Brook Mayfly and Northern Spring Salamander, CMP agreed to conduct presence/absence surveys in the Project area. CMP worked closely with MDIFW to identify potential habitat for these species. The results of the stream characterization surveys were provided to MDIFW on August 9, 2018. Based on survey results and with guidance provided by MDIFW, CMP conducted presence/absence surveys in September 2018. The results of the presence/absence surveys were provided to MDEP and MDIFW on October 19, 2018 (see weblink above).

Additionally, CMP made the following commitments to survey or provide reports to the MDEP:

- Bald Eagles, Site Law Application Section 7.4.3.1: "CMP will perform an aerial survey each spring prior to construction. These surveys will be used to determine if any new bald eagle nests have been established near the NECEC transmission line corridors and substations. "
- Great Blue Heron colonies, Site Law Application Section 7.4.4.9: "prior to initial transmission line clearing, CMP will complete surveys for heron colonies within or immediately adjacent (within 75-feet) to existing IWWH's within the NECEC Project, between April 20 and May 31 prior to each year of construction. If discovered, CMP will notify and consult with MDIFW biologist."
- Invasive Plant Species, NECEC Compensation Plan (1/30/2019), page 28: "Prior to construction CMP will submit to the MDEP and USACE, for approval, an invasive species plan for the survey, control, and treatment of invasive species on the Project, including the Little Jimmie Pond-Harwood Tract. CMP will implement the control measures approved by the MDEP and the USACE during

the first full growing season following permit issuance and will submit a report by December 31 of that year by documenting the efficacy of the treatment.”

CMP will provide evidence and/or the results of these surveys as they occur.

These commitments to survey and/or provide results of those surveys are part of the MDEP record and it is not necessary to incorporate them into the VCM or VMP because CMP will be bound by them.

#### DWAs

- **12/7/18 email item -- Include in compensation plan and VMP proposal to install land markers at limits of deer winter travel corridors for benefit of vegetation management crews.**
- **12/7/18 email item -- Include in VMP proposal to offset / vary maintenance schedule for 8 deer winter travel corridors.**
- **Include in VMP proposal to inform MDIFW in advance of planned maintenance of deer winter travel corridors so MDIFW can be present for that work.**

CMP hereby commits to undertake these actions, and will incorporate them into the VCP and VMP prior to construction.

#### Compensation / Preservation Tracts

- **Provide method of conveyances (fee, easement, lease, MOU, verbal permission, etc.) for snowmobile / ATV trails or any other permissions to use the land. Encumbrance documentation provided by CMP on 1/8/19 (7 DWA tracts) and 1/11/19 (6 original tracts) is not sufficiently clear.**

Attached please find the two spreadsheets from January 8 and 11, updated to provide additional clarity relating to the encumbrances for (1) the six compensation parcels (“Original 6 Comp parcels”) and (2) the seven DWA preservation parcels (“Additional Com parcels”). Also attached are the relevant encumbrance agreements, which apply to the parcels noted below and are further summarized on the attached Word document (Encumbrance Agreements Summary):

- Brookfield White Pine Hydro indenture (Lower Enchanted), SOM 5152-29
- Oxford Paper Co. easements (Lower Enchanted), SOM 2166-1
- Western Mountains Charitable Foundation trail lease (multiple parcels), SOM 3990-137
- State of Maine/DOC, trail use agreement (multiple parcels)
- Forks Area Chamber of Commerce license (multiple parcels)
- Weyerhaeuser/CMP Easement (multiple parcels)
- State of Maine/DOC license (Moxie Stream)

Generally, trails are granted by license on CMP land. Terms and conditions may vary between licenses but they are not permanent encumbrances. Trails will be excluded from the Declaration of Covenants and Restrictions (DOCR) to allow continued use of these trails



without conflicting with the DOCR. If the qualified holder is not the same entity that administers the trail, CMP may grant an easement for the trail to the trail administrator.

Existing easements are permanent encumbrances and therefore will be excluded from the DOCR. However, the fee interest under the easement would be conveyed to the qualified holder if the tract is being conveyed and not retained by CMP (as with the DWA tracts).

Recreational and commercial leases (i.e., camp lots and Maine Huts and Trails land) were excluded from acreage calculations, will not be subject to the DOCR, and will not be conveyed to a qualified holder. CMP will either retain ownership or convey these leased areas to the lessees.

CMP will work with qualified holders before a DOCR is placed on mitigation tracts to ensure traditional recreation uses can continue on the land and that neither the DOCR nor the recreational uses conflict with the qualified holder's management plan.

- **Are backup owners needed if fee not conveyed to BPL or MDIFW, to assure preservation?**

This is not necessary. As CMP stated in the January 30, 2019 supplemental materials, "Per chapter 310.6(F)(2), CMP will use the MDEP DOCR template (Attachment D), tailored for existing uses and encumbrances, and reserving the appropriate rights to CMP to manage vegetation [i.e. invasive species management], and intends to maintain fee ownership of these tracts and to manage them in compliance with the DOCR and associated restrictions (i.e., undeveloped in perpetuity) until such time that the tracts are transferred to (a) qualified holder, i.e., an entity or entities with experience and demonstrated stewardship capabilities." MDEP's DOCR form provides protection because it provides for MDEP enforcer no matter the identity of the owner.

See CMP's response to MDEP's December 28, 2018 Compensation Review Comments, submitted on 1/30/2019. MDEP web link: [2019-01-30 NECEC Response to MDEP Compensation Review Comments.pdf](#).

### **Sheepscot River Vegetation Planting Plan**

- **Verify that plan uses only native species and non-ornamentals (species names included sub-species).**

The plan only uses native species. This was confirmed using the USDA NRCS PLANTS Database (<https://plants.sc.egov.usda.gov/java/>).

## **NECEC Compensation Parcels – Encumbrance Agreements Summary**

### Lower Enchanted Parcel (Original 6)

- Indenture between CMP and Brookfield White Pine Hydro LLC, dated March 22, 2017, recorded in Somerset County Registry of Deeds in Book 5152, Page 29.

Under the Flagstaff Storage Project (FERC No. 2612-029) hydropower license issued by the Federal Energy Regulatory Commission, Brookfield was required to acquire rights to improve and maintain emergency and other access to the Dead River easterly of its confluence with Enchanted Stream in Lower Enchanted Stream Township.

The indenture conveys easements to Brookfield for: access for emergency vehicles, non-motorized public access, footpath access to the Dead River, right to construct and maintain a parking area and helipad, right to construct and maintain a gate to control motorized access, and access over the Lower Enchanted and Whiskey Roads.

- Right-of-Way Easement Deed, CMP to Oxford Paper Co, dated December, 22, 1995, recorded in Somerset County Registry of Deeds in Book 2166, Page 1.

Non-exclusive easement for access for forest operations and forestland management activities over a 66' right-of-way on an existing truck road and the construction and maintenance of roads and bridges within the right-of-way.

- Trail Use Lease Agreement between CMP and Western Mountains Charitable Foundation, dated March 31, 2008, recorded in Somerset County Registry of Deeds in Book 3990, Page 137.

Lease for the construction and maintenance of four segments of a 12' wide non-motorized, paved or unpaved, trail on the subject property (approximately 6,570 linear feet, or 1.8 acres). The initial term of the lease expires on June 30, 2025; however, starting on July 10, 2010 and thereafter for the initial term and any subsequent extension, CMP and WMCF will negotiate to extend the lease for a period of 20 years. No other use of the leased premises is allowed without prior written approval of CMP.

### Flagstaff Parcel (Original 6)

- Trail Use Lease Agreement between CMP and Western Mountains Charitable Foundation, dated March 31, 2008, recorded in Somerset County Registry of Deeds in Book 3990, Page 137.

Lease for the construction and maintenance of a 12' wide non-motorized, paved or unpaved, trail on the subject property (approximately 31,400 linear feet, or 8.3 acres). The initial term of the lease expires on June 30, 2025; however, starting on July 10, 2010 and thereafter for the initial term and any subsequent extension, CMP and WMCF will negotiate to extend the lease for a period of 20 years. No other use of the leased premises is allowed without prior written approval of CMP.

### Grand Falls (Original 6)

- Trail Use Lease Agreement between CMP and Western Mountains Charitable Foundation, dated March 31, 2008, recorded in Somerset County Registry of Deeds in Book 3990, Page 137.

Lease for the construction and maintenance of a 12' wide non-motorized, paved or unpaved, trail on the subject property (approximately 4,550 linear feet, or 1.25 acres). The initial term of the lease expires on June 30, 2025; however, starting on July 10, 2010 and thereafter for the initial term and any subsequent extension, CMP and WMCF will negotiate to extend the lease for a period of 20 years. No other use of the leased premises is allowed without prior written approval of CMP.

#### Basin Tract (Original 6)

- Reciprocal Easement Agreement between CMP and Weyerhaeuser Co, dated January 15, 2019, recorded in Somerset County Registry of Deeds in Book 5373, Page 1.

Document conveys a non-exclusive 66' wide access easement over the existing road to Weyerhaeuser for forest management, log transport and transportation of other forest products, rock and equipment, and construction/reconstruction/maintenance of the road.

#### Moxie Stream (Additional DWA)

- Indenture of license between CMP and State of Maine, Dept. of Conservation, dated November 19, 1981.

Though the document is vague as to the allowed use of the CMP property, the original intent was to allow the State to incorporate CMP lands adjacent to the State-owned Moxie Falls parcel into the State's management of its parcel (i.e., trails, observation platforms, etc.). The CMP lands involved are: a 100' wide corridor from the Moxie Road to the Kennebec River (old woods road), two 25' wide strips on either side of Moxie stream and within the State ownership, and that portion of the 1,000 strip along the Kennebec River and adjacent to the State lands.

Either party can terminate the agreement by providing a one year notice to the other party.

#### Pooler Ponds (Original 6)

- License between CMP and Forks Area Chamber of Commerce, dated January 13, 2005, amended March 1, 2006 to include Old Canada Road Scenic Byway, Inc. as co-licensee.

License is for the development and maintenance of a 12' wide public recreational trail for snowmobile and non-motorized use. No other uses are allowed without prior written approval from CMP. The initial term of the license is 1 year and is renewed annually and perpetually for additional 1 year terms unless either party provides the other with written notice of its intent to terminate the license at least 90 days prior to the end of the then current term.

- Trail Use Agreement between CMP and State of Maine, Dept. of Conservation, dated April 1, 2011.

Agreement provides for the use of CMP property for the construction, maintenance and use of 12' wide public recreation trails, and is primarily used for snowmobile and ATV trails. The initial term of the agreement is 3 years and automatically renews for additional 1 year terms unless terminated by either party giving written notice at least 30 days prior to the end of the then current term.

Local snowmobile/ATV clubs (Northern Outdoors Snowmobile Club in this instance) typically are co-licensees for sections of the trails in their territory. This is the same trail as the trail licensed with the Forks Area Chamber of Commerce.

The Forks parcels (Map 8, Lot 11, Map 11, Lots 2 and 9) (Additional DWA)

- Trail Use Agreement between CMP and State of Maine, Dept. of Conservation, dated April 1, 2011.

Agreement provides for the use of CMP property for the construction, maintenance and use of 12' wide public recreation trails, and is primarily used for snowmobile and ATV trails. The initial term of the agreement is 3 years and automatically renews for additional 1 year terms unless terminated by either party giving written notice at least 30 days prior to the end of the then current term.

Local snowmobile/ATV clubs (Northern Outdoors Snowmobile Club and Lake Moxie ATV Riders) typically are co-licensees for sections of the trails in their territory.

| Township                | Parcel              | Easements                                                                                    | Leases                                                                                  | Rights-of-way                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Permissions                                                                                                                                                                                                                                                                              | Reservations/Exceptions                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
|-------------------------|---------------------|----------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| The Forks               | The Forks 8/11 IF&W | Well and Spring Line Easement (SOM 619-131).<br>Water line serving Town Office (SOM 642-131) |                                                                                         | Cemetery Road.<br>Mort Bean conveyed to Joseph Durgin right to cross lot known as D.H. Williams lot (SOM 346-364)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | Trail Use Agreement with State of Maine, Dept. of Conservation, co-licensees Northern Outdoors Snowmobile Club (not recorded). License is for 12' wide snowmobile trail.                                                                                                                 | Gravel Pit, area excluded.<br>Joseph Durgin reserved right to take water and maintain pipe from the spring on the hill (SOM 467-547).<br>Water Durgin reserved right to water that furnished houses (SOM 351-356).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
|                         |                     |                                                                                              |                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Trail Use Agreement with State of Maine, Dept. of Conservation, co-licensees Lake Moxie ATV Riders and Northern Outdoors Snowmobile Club (not recorded). License is for 12' wide ATV and snowmobile trails.                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                         | The Forks 11/2 IF&W | 50 foot-wide easement to Inn by the River (SOM 2154-291)                                     |                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Trail Use Agreement with State of Maine, Dept. of Conservation, co-licensees Lake Moxie ATV Riders and Northern Outdoors Snowmobile Club (not recorded). License is for 12' wide ATV and snowmobile trails.                                                                              | Excepted and reserved to Grantor, heirs and assigns, the right to take water from a spring and right to maintain a pipe for use at house located on excepted lot. Also excepted and reserved to Grantor, heirs and assigns, in common with Grantee and other the right to use the driveway from Lake Moxie Road to the excepted lot (SOM 536-177).                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Moxie Gore              | The Forks 11/9 IF&W |                                                                                              | CMP Lease 011-009 Cummings, area excluded.<br>CMP Lease 011-009 Peabody, area excluded. |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                         |                     |                                                                                              |                                                                                         | Excepted and reserved to T-M Corp. a 60 foot-wide, all purpose r-o-w along Carry Brook Road (SOM 1921-329).<br>Carry Brook Road (SOM 2540-24).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Indenture of License with State of Maine, Dept of Conservation (not recorded). Indenture allows the use of CMP land (100' wide strip, two 25' wide strip either side of Moxie Stream, and 1,000' wide strip along Kennebec River) in conjunction with adjacent State Moxie Falls parcel. | Dynamite Road                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
|                         | Carry Brook IF&W    |                                                                                              |                                                                                         | Undefined rights-of-way, easements and reservations described in 14 earlier deeds (SOM 536-141).<br>William T. Haynes reserved the right to cross 100 foot strip (SOM 343-315).<br>Coburn Land Trust reserved right to cross strip (SOM 401-176 and SOM 343-318).<br>Bingham Lumber Company reserved right to cross 100 foot strip (SOM 401-178 and SOM 343-328) and excepted and reserved Somerset Railway Company r-o-w (SOM 343-328).<br>Clark, Towne and Moore reserved right to cross said strip (SOM 343-305).<br>Gray and Clay reserved right to cross strip (SOM 343-312).<br>Excepting and reserving the Somerset Railway Company r-o-w (SOM 343-312).<br>Gray and Clay reserved the right to cross (SOM 351-572).<br>Coburn Land Trust excepted and reserved the Somerset Railway Company r-o-w (SOM 343-318).<br>Gray, Snow and Clay reserved right to cross strip and Somerset Railway company r-o-w (SOM 343-308).<br>Philbrick reserved right to cross strip and excepted and reserved Somerset Railway Company r-o-w (343-301).<br>Coburn reserved right to cross strip and excepted and reserved Somerset Railway company r-o-w (SOM 343-324). |                                                                                                                                                                                                                                                                                          | Undefined rights-of-way, easements and reservations described in 14 earlier deeds (SOM 536-141).<br>William T. Haynes excepted and reserved standing timber (thought to be resolved) (SOM 343-315).<br>Coburn Land Trust reserved standing timber (thought to be resolved) (SOM 401-176 and SOM 343-318).<br>Bingham Lumber Company reserved standing timber (thought to be resolved) (SOM 401-178 and SOM 343-328).<br>Clark, Towne and Moore reserved standing timber (thought to be resolved) (SOM 343-305).<br>Gray and Clay reserved standing timber (thought to be resolved) (SOM 343-312 and SOM 351-570).<br>Gray, Snow and Clay reserved standing timber (thought to be resolved) (SOM 343-308).<br>Coburn reserved standing timber (SOM 343-324).                      |
| Moxie Stream Lower IF&W |                     |                                                                                              |                                                                                         | Subject to r-o-w in common on former r-o-w of Somerset Railway Company and/or Maine Central Railroad Company (SOM 539-99).<br>Remaining Portion- Camp Road (non-locus).<br>William T. Haynes reserved the right to cross 100 foot strip (SOM 343-315).<br>Coburn Land Trust reserved right to cross strip (SOM 401-176).<br>Bingham Lumber company reserved right to cross 100 foot strip (SOM 401-178 and 343-328) and excepted and reserved Somerset Railway Company r-o-w (343-328).<br>Clark, Towne and Moore reserved right to cross said strip (SOM 343-305).<br>Gray and Clay reserved right to cross strip (SOM 343-312) and excepted and reserved the Somerset Railway Company r-o-w (SOM 343-312).<br>Gray and Clay reserved the right to cross (SOM 351-572).<br>Gray, Snow and Clay reserved right to cross strip and Somerset Railway company r-o-w (SOM 343-308).<br>Philbrick reserved right to cross strip and excepted and reserved Somerset Railway Company r-o-w (343-301).<br>Coburn reserved right to cross strip and excepted and reserved Somerset Railway company r-o-w (SOM 343-324).                                                 |                                                                                                                                                                                                                                                                                          | Excepting all land now owned by CMP (SOM 539-99).<br>Dynamite road.<br>On remaining portion- CMP SEC 222 and Harris Dam Road (non-locus).<br>William T. Haynes excepted and reserved standing timber (thought to be resolved) (SOM 343-315).<br>Coburn Land Trust reserved standing timber (thought to be resolved) (SOM 401-176).<br>Bingham Lumber Company reserved standing timber (thought to be resolved) (SOM 401-178 and SOM 343-328).<br>Clark, Towne and Moore reserved standing timber (thought to be resolved) (SOM 343-305).<br>Gray and Clay reserved standing timber (thought to be resolved) (SOM 343-312 and 351-570).<br>Gray, Snow and Clay reserved standing timber (thought to be resolved) (SOM 343-308).<br>Coburn reserved standing timber (SOM 343-324). |
|                         | Squaretown IF&W     |                                                                                              |                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Unrecorded license to State of Maine dated 11-19-1981                                                                                                                                                                                                                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |
|                         | Indian Stream       |                                                                                              |                                                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |

Blue text for areas to be excluded from the compensation parcel.



Summary of Encumbrances on Original 6 (Compensation I) Comp Properties  
January 7, 2019.

| Township                                     | Parcel                                     | Net Acres | Easements                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Leases                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | Rights-of-Way | Permissions                                                                                                                                                                                                                      | Reservations/Exceptions                                                                                                                                                                                            |
|----------------------------------------------|--------------------------------------------|-----------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Pierce Pond                                  | Basin Tract                                | 695       | Reciporical Easement Agreement w/Weyerhaeuser (SOM 5373/1). Conveys 66' wide access easement over existing road.                                                                                                                                                                                                                                                                                                                                                                                                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                                                                                                                                                                                                                                  | Kennebec Land Company reserved timber rights in the deed to CMP (SOM 413-221). These expired July 1931.<br>Kennebec Land Company reserved right to land logs on bank of Dead River in the same deed (SOM 413-221). |
|                                              |                                            |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                                                                                                                                                                                                                                  |                                                                                                                                                                                                                    |
| Lower Enchanted                              | Enchanted Stream                           | 225       | Indenture with Brookfield White Pine Hydro LLC (SOM 5152/29). Conveys easement to Brookfield to improve and maintain emergency and other access to Dead River near confluence of Enchanted Stream. Also assigns perpetual easement to Brookfield (same as from OPC to CMP, SOM 2165-348) extending from Route 201 to Easement Area. <b>Emergency Access area is excluded from comp parcel.</b><br><br>Easement to Oxford Paper Company (SOM 2166/1). Conveys 66' wide access easement over land of CMP in Lower Enchanted Twp. | Trail Use Lease Agreement with Western Maine Charitable Foundation (SOM 3990/137).<br>construction/maintenance of four segments of a 12' wide non-motorized trail (6,570 linear feet) on CMP property.                                                                                                                                                                                                                                                                                                                                                                                        |               |                                                                                                                                                                                                                                  | Snow reserved timber for one year in the deed to CMP in June 1922 (SOM 373-250).<br>Snow reserved right to land logs on bank of Enchanted Stream and Dead River in the same deed (SOM 373-250).                    |
|                                              |                                            |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                                                                                                                                                                                                                                  |                                                                                                                                                                                                                    |
| Carrying Place Town Twp. and Dead River Twp. | Flagstaff Lake                             | 770       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Trail Use Lease Agreement with Western Maine Charitable Foundation (SOM 3990/137).<br>construction/maintenance of a 12' wide non-motorized trail (31,400 linear feet) on CMP property.<br><br>Lease with WMCF for day use area, parking, huts and storage buildings on CMP property on July 1, 2005. Lease was then amended twice (March and October 2007)- <b>area excluded from comp parcel.</b><br><br>Recreational Camp Lot Lease and access thereto- Enman, <b>area excluded from comp parcel.</b>                                                                                       |               |                                                                                                                                                                                                                                  |                                                                                                                                                                                                                    |
|                                              |                                            |           |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                                                                                                                                                                                                                                  |                                                                                                                                                                                                                    |
| Spring Lake                                  | Grand Falls                                | 117       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | Trail Use Lease Agreement with Western Maine Charitable Foundation (SOM 3990/137).<br>construction/maintenance of a 12' wide non-motorized trail (4,550 linear feet) on CMP property.<br><br>Lease (SOM 3700/279) with Western Mountains Foundation for a campsite, canoe portage and access roads, and amended on 3-1-2007, 10-19-2007, and 8-1-2009. <b>area excluded from comp parcel.</b><br><br>Recreational Camp Lot Lease and access thereto- Powers, <b>area excluded from comp parcel.</b><br><br>Camp Lot Lease and access thereto- Staples, <b>area excluded from comp parcel.</b> |               | Trail Use Agreement with State of Maine, Dept. of Conservation, co-licensee Arnold Trail Snowmobile Trail Club (not recorded).<br>License is for 12' wide snowmobile trail.<br>Northern Forest Canoe Trail (document not found). |                                                                                                                                                                                                                    |
| Manchester                                   | Little Jimmie Pond (no encumbrances found) | 110       |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |               |                                                                                                                                                                                                                                  |                                                                                                                                                                                                                    |
| The Forks                                    | Pooler Ponds                               | 80        |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | License with Forks Area Chamber of Commerces. License for 12' wide snowmobile and non-motorized trail use (FAST trail).<br>Three Rivers Whitewater lease agreement for commercial campground abuts to the north ( <b>Non-locus to comp parcel area</b> ).                                                                                                                                                                                                                                                                                                                                     |               | Trail Use Agreement with State of Maine, Dept. of Conservation, co-licensee Northern Outdoors Snowmobile Club (not recorded).<br>License is for 12' wide snowmobile trail (same location as FAST trail.                          |                                                                                                                                                                                                                    |

Blue text for areas to be excluded from the compensation parcel.

## INDENTURE

THIS INDENTURE made and entered into this 22 day of March, 2017 by and between **CENTRAL MAINE POWER COMPANY**, a Maine corporation having its principal place of business at 83 Edison Drive, Augusta, Maine 04336 (together with its successors and assigns, "**CMP**") and **BROOKFIELD WHITE PINE HYDRO LLC**, a Delaware limited liability company, formerly known as FPL Energy Maine Hydro LLC, whose mailing address is 150 Maine Street, Lewiston, Maine 04240 (together with its successors and assigns, "**Brookfield**"),

WHEREAS, the hydropower license issued by the Federal Energy Regulatory Commission ("**FERC**") to Brookfield for the Flagstaff Storage Project (FERC No. 2612-029) (the "**Project**") and related recreation plan approved by FERC Order issued May 19, 2014 (147 FERC ¶ 62,136) requires that Brookfield acquire rights to improve and maintain emergency and other access to the Dead River easterly of its confluence with Enchanted Stream in Lower Enchanted Stream Township, Somerset County, Maine;

WHEREAS, Brookfield, CMP and others are party to that certain First Amended and Restated Asset Purchase Agreement, dated as of April 7, 1999 (the "**ARAPA**"), which specifies at Section 7.18(j) that Brookfield's sole responsibility to pay a purchase price for the rights conveyed by CMP hereunder is to pay \$1.00 and that all other purchase price shall be collectible by Seller only from Benefited Hydro Developers other than Brookfield under that certain Kennebec Headwaters Benefits Agreement, dated as of July 19, 1988, by and among CMP and others, as approved by FERC Order issued May 21, 1992 (59 FERC ¶ 82,182);

WHEREAS, certain of the rights and easements conveyed hereby are located on a certain parcel of land located in Lower Enchanted Stream Township, Somerset County and State of Maine, that is more particularly delineated and described in Exhibit A, attached hereto (the "Easement Area");

### WITNESSETH:

**A. Grant of Easements.** **CMP**, for and in consideration of One Dollar, receipt of which is hereby acknowledged, hereby GRANTS to **BROOKFIELD**, its successors and assigns, with QUITCLAIM COVENANT, the following rights and easements:

1. Vehicle Access. The perpetual, non-exclusive right and easement on, over and across the private access road in the Easement Area between Whiskey Stream Road and the northerly side of the Dead River (as it may be relocated in accordance with the provisions of the Indenture, the "Access Road"), in common with CMP and others, for ingress and egress by vehicles as follows: (a) emergency vehicles operated by emergency response personnel; and (b) vehicles of any type operated by Brookfield, its employees, agents and contractors for purposes of inspecting, constructing, replacing and maintaining the Access Road and the parking area and helipad described in Paragraph 4 below (the "Vehicle Access Easement").

2. Public Access. The perpetual, non-exclusive right and easement on, over and across the Access Road, in common with CMP and others, for ingress and egress by the general public on foot or by wheel chair (whether or not motorized), bicycle or other non-motorized vehicle of a width that can bypass the Entrance Gate described in Paragraph 5 below (the "Public Access Easement").



3. Path from Easement Area to Dead River. The perpetual, non-exclusive right and easement on, over and across the existing footpath between the southerly bound of the Easement Area and the northerly bank of the Dead River, approximately at the location depicted on Exhibit A (the "Footpath"), in common with CMP and others, for ingress and egress by (a) Brookfield, its employees, agents and contractors for purposes of inspecting, constructing, replacing and maintaining the Footpath; (b) emergency response personnel; and (c) the general public on foot or by wheel chair (whether or not motorized), bicycle or other non-motorized vehicle of a width that can bypass the Entrance Gate described in Paragraph 5 below (the "Footpath Easement").

4. Parking Area and Helipad. The perpetual, **exclusive** right and easement to construct, replace, maintain, operate and use a parking area and helipad at a location within the Easement Area and of a size and dimensions to be determined by Brookfield after reasonable consultation with CMP (as it may be relocated in accordance with the provisions of the Indenture, the "Parking Area") for: (a) parking and loading emergency vehicles; (b) landing, parking and loading of helicopters; and (c) parking of vehicles and equipment operated by Brookfield, its employees, agents and contractors (the "Parking Easement").

5. Entrance Gate. The perpetual, right and easement to construct, replace, maintain and operate a gate across the Access Road, more specifically described below (the "Entrance Gate"), to control access by motor vehicles over the Access Road at a location near the intersection of the Access Road with Whiskey Stream Road to be determined by Brookfield after reasonable consultation with CMP (the "Entrance Gate Easement" and, together with the Vehicle Access Easement, the Public Access Easement, the Footpath Easement, the Parking Easement and the rights described in Paragraphs 5, 6 and 7, the "Granted Easements").

6. Access Road and Footpath Maintenance. The perpetual right, but not the obligation, in common with CMP, to improve, maintain, repair and reconstruct the Access Road and the Footpath, together with such ditches, culverts, bridges and other structures within the Easement Area and in the immediate vicinity of the Footpath as may be necessary or convenient in the conduct of such improvement, maintenance, repair or reconstruction.

7. Whiskey Road and Lower Enchanted Stream Road. In accordance with the rights granted to CMP in that certain Right-of Way Easement Deed given by Oxford Paper Company to CMP, dated December 22, 1995, and recorded in the Somerset County Registry of Deeds, Book 2165, Page 348 (the "Right-of-Way Easement Deed"), the perpetual, non-exclusive right and easement: (a) on, over and across the portions of Whiskey Stream Road and Lower Enchanted Road that afford access between the Easement Area and US Route 201 in Forks Plantation, in common with CMP and others, for ingress and egress by (i) Brookfield, its employees, agents and contractors for purposes of administration, forest operations and forestland management as defined in the Right-of Way Easement Deed; and (ii) emergency response personnel for purposes of emergency safety access as provided in the Right-of Way Easement Deed; and (b) to install, maintain, remove and replace directional signs within the right of way of Lower Enchanted Road at the intersection between Lower Enchanted Road and US 201 to direct emergency personnel to the Easement Area.

8. Clearing of Trees, Brush, Etc. The perpetual right to clear trees, brush and other vegetation in the vicinity of the Access Road, the Parking Area, the Footpath and the Entrance



Gate as reasonably necessary or desirable for the maintenance or use of such facilities as contemplated hereby.

9. FERC Compliance. The perpetual right to take such other actions within the Easement Area or the vicinity of the Footpath as may be reasonably necessary or desirable for Brookfield's compliance with the terms and provisions of (a) any FERC license for the Project; (b) any present or future order or directive issued by FERC; and (c) any recreational or other plan or agreement to which Brookfield is now or hereafter becomes a party in accordance with the terms and provisions of any such FERC license, order or directive.

10. Relocation of Granted Easements. Brookfield shall have the right to relocate all or part of either or both of the Access Road and the Parking Area and the related the Granted Easements from time-to-time; provided that (a) the rights of CMP and others with rights to use the Granted Easements shall not be materially impaired by such relocation; (b) Brookfield shall give CMP at least one hundred twenty (120) days' advance written notice of such relocation; (c) the location of the relocated facility and related Granted Easement shall be subject to the approval of CMP, which approval shall not be unreasonably delayed, conditioned or denied; and (d) Brookfield shall pay for all costs of such relocation including but not limited to reconstruction of any road, parking area or other improvement in the Easement Area that must be relocated as a result of the relocation of any Granted Easement.

11. Construction and Operation of Entrance Gate. Brookfield covenants and agrees to maintain the existing Entrance Gate in good condition in accordance with the following terms and provisions: (a) the Entrance Gate will be a locked metal gate; (b) large rocks will be place on each side of the Entrance Gate at locations that will allow passage by the public on foot or by wheel chair (whether or not motorized), bicycle or other non-motorized vehicle of a width of 40 inches or less; (c) each of Brookfield, CMP, local emergency responders designated by Brookfield (the "Designated Responders") and others with rights of access over the Access Road will have the keys, combination or other means to unlock the Entrance Gate for purposes of allowing access on, over and across the Access Road as contemplated hereby; and (d) neither CMP nor Brookfield will have the right to change the lock on the Entrance Gate without giving the other party, the Designated Responders and others with rights of access over the Access Road the means to unlock the Entrance Gate and use the Easement Area as contemplated hereby.

12. Appurtenant Rights. The rights and easements conveyed by CMP to Brookfield by this Indenture are intended to be (a) appurtenant to, benefit and run with Brookfield's leasehold and other rights and interests in lands comprising the Project, including but not limited to the land located within the FERC project boundary as delineated on certain Project Plans recorded in the Somerset County Registry of Deeds, in Plan File No. 49, pages 36 through 40, and conveyed by CMP to Brookfield under and pursuant to that certain Deed Indenture between CMP and Brookfield, dated April 7, 1999 and recorded in said Registry of Deeds, Book 2540, Page 1; and (b) burden and run with the land included in the Easement Area.

13. Compliance and Laws. Brookfield will promptly obtain and comply with, at its sole expense, all local, state and federal permits, and will comply with all laws, ordinances, rules, regulations and requirements of all federal, state and local governments and appropriate departments, commissions, boards and officers thereof which now or in the future may be applicable to the exercise of the rights herein granted.

14. Release and Indemnification. Brookfield agrees to release, indemnify, defend and hold harmless CMP, its parent corporation and affiliates and its and their directors, officers, employees, contractors, agents, successors and assigns from and against all costs (including attorney's fees), claims, demands and actions arising out of the exercise of the rights herein granted or other use of the Easement Area by Brookfield or its successors and assigns, agents, contractors, invitees or others pursuant to this Indenture or otherwise. Notwithstanding this agreement, Brookfield does not herein waive the immunities, defenses and limits of liability provided to it pursuant to State law, including but not limited to the provisions of the Maine Tort Claims Act, 14 M.R.S.A. §8101 Et. Seq. if applicable. Brookfield shall provide proof that its contractor has general liability insurance in the amount of one million dollars (\$1,000,000) naming CMP as additional insured thereon, for the period of construction on CMP's property, and proof that the contractor has bonds as required by law.

[End of Page. Signature Pages Follow.]

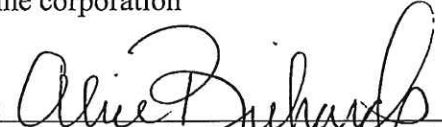


IN WITNESS WHEREOF, Central Maine Power Company has caused this instrument to be executed on its behalf by its duly authorized representative, as of this 28 day of March, 2017.

SIGNED, SEALED AND DELIVERED  
IN THE PRESENCE OF:

CENTRAL MAINE POWER COMPANY, a  
Maine corporation

  
\_\_\_\_\_  
Witness


By:   
\_\_\_\_\_  
Alice Richards, Supervisor, Real Estate  
Services

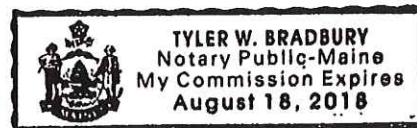
STATE OF Maine  
County of Kennebec ss.

March 28<sup>th</sup>, 2017

Then personally appeared the above-named Alice Richards, Supervisor, Real Estate Services of Central Maine Power Company, and acknowledged the foregoing instrument to be her free act and deed in her said capacity, and the free act and deed of said Central Maine Power Company.

Before me,

  
\_\_\_\_\_  
Notary Public  
Printed Name: \_\_\_\_\_  
Commission expires: \_\_\_\_\_



SEAL

IN WITNESS WHEREOF, Brookfield White Pine Hydro LLC has caused this instrument to be executed on its behalf by its duly authorized representatives as of this 22 day of March, 2017.

SIGNED, SEALED AND DELIVERED IN  
THE PRESENCE OF:

**BROOKFIELD WHITE PINE HYDRO  
LLC**, a Delaware limited liability company

[Signature]  
Witness

By:

C. Todd Wynn  
Name: C. TODD WYNN  
Its: V.P. NORTHEAST

[Signature]  
Witness

By:

Name:  
Its:

STATE OF Maine  
County of Androscoggin, ss.

March 22, 2017

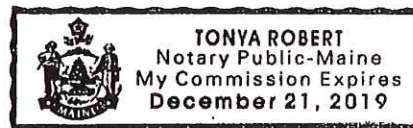
Then personally appeared the above-named C. Todd Wynn, V.P. Northeast of Brookfield White Pine Hydro LLC, a Delaware limited liability company, and acknowledged the foregoing instrument to be his/her free act and deed in said capacity, and the free act and deed of said Brookfield White Pine Hydro LLC.

Before me,

[Signature]

Notary Public

Printed Name: Tonya A Robert



SEAL

**EXHIBIT A**

Attached to and being a part of Indenture (Somerset County) from Central Maine Power Company to Brookfield White Pine Hydro LLC, dated March 22, 2017

The Easement Area is depicted on the plan attached as Exhibit A-1, and is bounded and described as follows:

A certain lot or parcel of land situated on the southerly side of the Whiskey Springs Road, so called, in Lower Enchanted Township, County of Somerset, State of Maine and being more particularly described as follows:

Beginning at a 3/4" iron rebar with identification cap found on the southerly side of the Whiskey Springs Road;

Thence an azimuth of 291°01' along said Whiskey Springs Road, a distance of 255.9 feet to a similar rebar found;

Thence an azimuth of 242°57', a distance of 23.3 feet to a point in the thread of a 4-foot wide brook;

Thence an azimuth of 104°55' along said thread of said brook, a distance of 23.3 feet to a point;

Thence an azimuth of 213°52' along said thread of said brook, a distance of 25.6 feet to a point;

Thence an azimuth of 211°54' along said thread of said brook, a distance of 192.4 feet to a point;

Thence an azimuth of 250°44' along said thread of said brook, a distance of 146.7 feet to a point;

Thence an azimuth of 269°57' along said thread of said brook, a distance of 380.4 feet to a point;

Thence an azimuth of 251°44' along said thread of said brook, a distance of 284.2 feet to a point;

Thence an azimuth of 343°22', a distance of 6.7 feet to a 12" fir tree;

Thence an azimuth of 274°30', a distance of 82.0 feet to a 12" spruce tree;

Thence an azimuth of 265°00', a distance of 152.4 feet to a 2" fir stump;

Thence an azimuth of 265°00', a distance of 89.1 feet to a point;

Thence an azimuth of 146°20', a distance of 348.8 feet to 5/8" iron rebar with identification cap #2157 set;

Thence an azimuth of 207°09', a distance of 327.15 feet to a similar rebar set;

Thence an azimuth of 106°58', a distance of 187.3 feet to a similar rebar set;

Thence an azimuth of 67°27', a distance of 161.6 feet to a 5" blazed poplar tree found;

Thence an azimuth of 330°21', a distance of 118.4 feet to a similar rebar found;

Thence an azimuth of 15°49', a distance of 173.8 feet to similar rebar found;

Thence an azimuth of 81°01', a distance of 204.1 feet to similar rebar found;

Thence an azimuth of 80°24', a distance of 788.8 feet to similar rebar found;

Thence an azimuth of 17°35', a distance of 415.4 feet to the point of beginning.

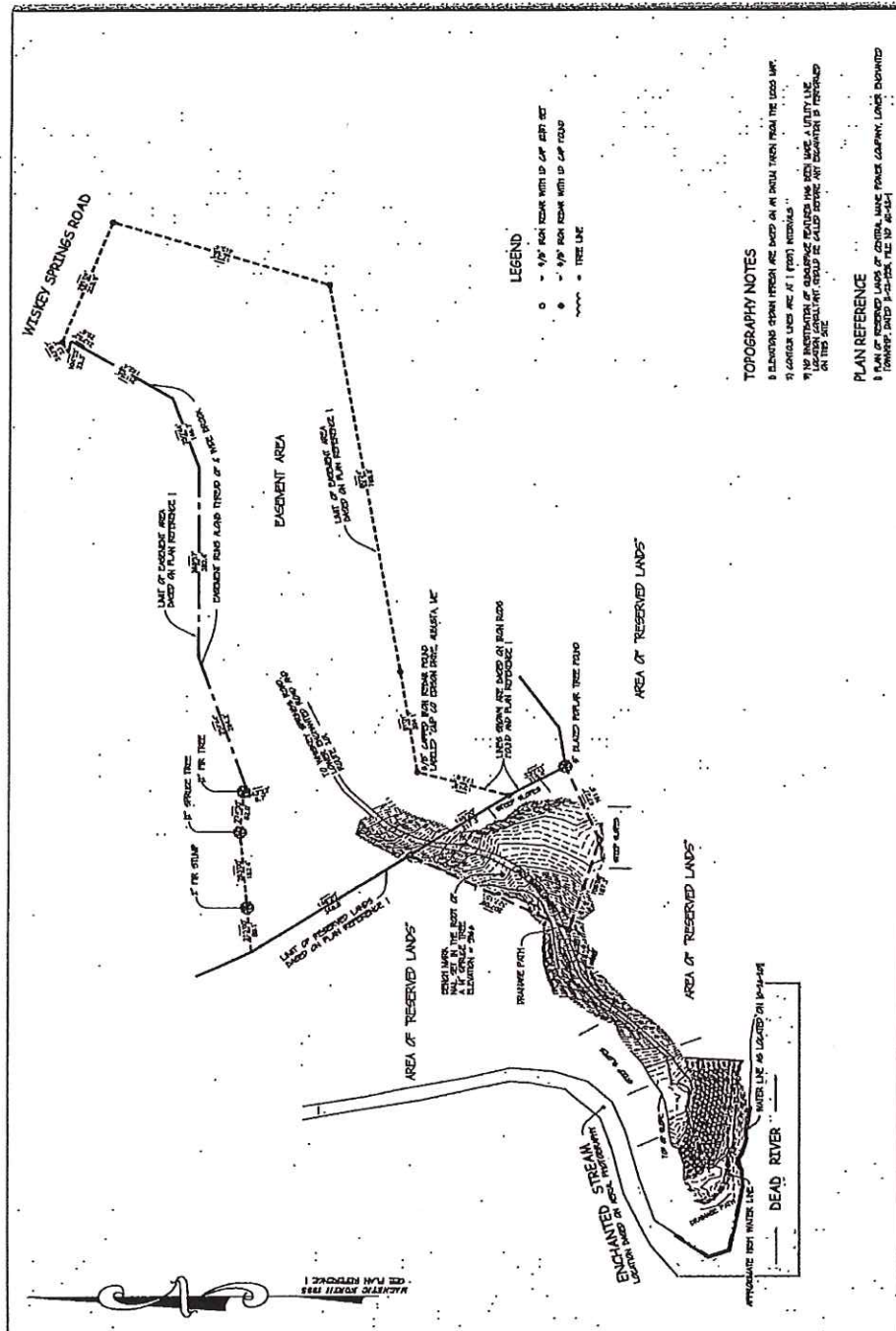
The azimuths referenced above are based on a magnetic observation in 1995.

The above-described Easement Area is a portion of certain property, a one-half interest in which was conveyed to CMP by Oxford Paper Company by Indenture, dated December 22, 1995, and recorded in said Registry of Deeds, Book 2165, Page 339, and another one-half interest was conveyed to Central Securities Corporation by deed of Willie D. Snow, dated May 1, 1923, and recorded in said Registry of Deeds, Book 373, Page 250.

Reference is made to a Plan of Reserved Lands of Central Maine Power Company, Lower Enchanted Township, Somerset County, Maine, dated December 22, 1995, by Central Maine Power Company, File No. 612-22-1, as recorded in said Registry of Deeds, Plan File B-95, Page 132.

The rights and easements in, on and across the Easement Area granted hereby are subject to the rights and easements granted to Oxford Paper Company, its successors and assigns, by Right-of-Way Easement Deed, dated December 22, 1995, and recorded in said Registry of Deeds, Book 2165, Page 348.



**EXHIBIT A-1**



TRANSFER TAX PAID

5536

BK 2166 Pg. 001

## RIGHT-OF-WAY EASEMENT DEED

**CENTRAL MAINE POWER COMPANY**, a Maine corporation having its principal offices in the City of Augusta, County of Kennebec, State of Maine, with a mailing address of 83 Edison Drive, Augusta, Maine 04336, (hereinafter "Grantor"), in consideration of One Dollar (\$1.00) paid and other good and valuable consideration given to Grantor by Oxford Paper Company, the receipt whereof is hereby acknowledged, does hereby grant to **OXFORD PAPER COMPANY**, a Delaware corporation having a place of business in the Town of Rumford, County of Oxford, State of Maine, with a mailing address of Boise Cascade Corporation, Rumford Mill, Rumford, Maine 04276, (hereinafter "Grantee"), and its successors and assigns, with QUITCLAIM COVENANTS, perpetual non-exclusive easements and rights-of-way for people, vehicles, equipment and materials to pass and repass over and across certain roads located on certain lands of Grantor in Somerset County, Maine to Grantee's lands as more particularly located and described on Exhibit A, annexed hereto. 10015

Said easements and rights-of-way are in common with Grantor and others. Said easements and rights-of-way, or portion(s) thereof, are collectively referred to herein as "Rights-of-Way," and are subject to, the rights, restrictions, terms and conditions contained more fully hereinafter set forth:

### RIGHTS, RESTRICTIONS, TERMS AND CONDITIONS

(1) Purpose: The said easement and a right-of-way over and across the Rights-of-Way is for the purpose of ingress, egress, and regress on foot and in vehicles, to, from, and for the use and enjoyment of certain lands now of Grantee, to which the same shall be deemed

RESEARCH/RECORDS SERVICES



1127460

625602

appurtenant for the purposes of Grantee's administration forest operations and forestland management activities.

"Administration" shall mean activities necessary to conduct, direct and manage business, including, but not limited to, the emergency safety access of the shores of the Enchanted Stream, the Dead River, the Kennebec River and other water bodies.

"Forest operations" shall mean timber harvesting and associated activities, and road construction and maintenance.

"Forestland management" shall mean property maintenance, forest management (both extensive and intensive), forestland resource protection, research activities, and other activities normally associated with traditional forestland management functions.

The purposes encompassed by administration, forest operation, and forestland management activities exclude, but the exclusion is not limited to residential developments; commercial and non-commercial recreational uses; installation of utilities; and public access.

(2) Grantor Reservation: Grantor reserves to itself the ownership of the roads and the right to use the Rights-of-Way at any time and for any corporate purpose, including but not limited to all purposes deemed necessary for the protection, administration, management and use of Grantor's lands and resources, so long as Grantor's activities do not unreasonably interfere with the use of the Rights-of-Way by Grantee.

(3) Grantee's Use: The Rights-of-Way shall be sixty-six (66) feet in width. Grantee shall have the right to pass over and across the Rights-of-Way (subject to Grantee's compliance with applicable laws, ordinances, and regulations), and to construct, reconstruct, use, improve and maintain roads, bridges, culverts, ditches, and other facilities and structures (other than utilities), within the Rights-of-Way and such additional widths as may be required on

intermittent segments of the Rights-of-Way to accommodate and protect cuts, fills, turnouts, drainage devices, and lateral ditches. Grantee shall not be obligated to construct, reconstruct, relocate, improve and maintain the roads except as is specifically provided for herein. Grantee shall exercise its rights in a way which do not unreasonably interfere with Grantor's or any other persons' lawful uses of any roads within the Rights-of-Way. It is further understood and agreed that this conveyance by Grantor to Grantee shall not restrict Grantor's right, at Grantor's expenses, to construct, reconstruct, use, relocate, improve, or maintain any roads within the Rights-of-Way or lawfully to abandon or to discontinue maintenance of roads within any Right-of-Way.

Grantee shall not leave litter or refuse on the Rights-of-Way.

(4) Grantee's Maintenance: Grantee shall provide Grantor with reasonable advance written notice of Grantee's commencement and suspension of the regular use of any Right-of-Way for forest products transportation. When any of the Rights-of-Way are being used by either Grantor or Grantee, and are not being used concurrently by the other party, then the using party shall maintain, during its use, and upon completion of its use of the Rights-of-Way so used, restore, the same in a condition no less than substantially equivalent to their condition immediately preceding the commencement of its use, or as subsequently improved.

When any of the Rights-of-Way are being used by Grantor and Grantee concurrently, both parties shall apportion the maintenance costs for such concurrent use based on the respective volume of products and distances hauled on the Rights-of-Way, or based on some other mutually agreed upon formula or method of apportionment. The specific method of calculating the pro rata share of maintenance costs shall be agreed upon by the parties prior to the commencement of concurrent regular use. The pro rata share of maintenance costs for concurrent regular use shall be settled on an annual basis.



Reasonably contemporaneously with the suspension of Grantee's use, Grantee shall take such steps as are reasonably or legally required to prevent sedimentation of water courses and soil erosion with respect to any Right-of-Way after such suspension, but in no event shall Grantee be responsible for sedimentation of water courses and soil erosion occurring more than twenty-four (24) months following its notification to Grantor of Grantee's suspension of regular use. With respect to a Right-of-Way of which Grantee has notified Grantor of its suspension of regular use, Grantor may cause an inspection of such Right-of-Way to be performed within thirty (30) days after Grantee's suspension of use, however, Grantor's failure to conduct such inspection shall not relieve Grantee of its obligations herein. Grantee shall promptly take such steps as are reasonably or legally required to remedy any non-fulfillment of such obligations.

Subject to the above, neither Party shall be obligated to maintain the Rights-of-Way under the terms of this Grant except to the extent that such maintenance relates to use of such Rights-of-Way by the obligated party.

Notwithstanding all of the above, Grantor and Grantee shall not be required to maintain the Rights-of-Way in a condition greater than the generally accepted standard of the day, in the Northeast, for off public highway hauling of timber.

(5) Usage Requirements: The exercise of the rights of Grantee under this Grant shall be in accordance with Grantor's reasonable road usage requirements and those requirements that a prudent landowner would adopt, including, but not limited to, speed limits, weight limits, fire protection, seasonable use, time of day use, use by off highway recreational vehicles, and public access.

(6) Post and Gate: Grantor retains the right, at its discretion, to post, gate and close the Rights-of-Way, except that Grantee shall have the right to pass through the gate for Grantee's

administration, forest operations and forestland management purposes in accordance with Grantor's gate closing policy, and said posting, gating and closure shall not unreasonably restrict the rights of Grantee for said purposes under this Grant. Grantee shall not obstruct or gate the Rights-of-Way without Grantor's prior written consent and shall not have the right to restrict entry or access by others.

In addition, the Rights-of-Way may be gated or otherwise posted with mutual consent of Grantor and Grantee when weather conditions and/or road conditions make passage unsafe or damaging to the roads, or as otherwise mutually agreed upon. The party desiring to install a gate shall bear the cost thereof. In the event that the fee owner of the land and Grantee should disagree as to the location of the gate, the location selected by the fee owner of the land shall determine the exact site of said gate. The party installing the gate shall insure that any other parties having a right to use said roads are provided with the lock's key or combination. This right to install a gate shall not unreasonably interfere with Grantor's or any other person's lawful uses of roads within the Rights-of-Way.

(7) Relocation: With respect to the rights assigned herein, Grantee agrees to use the existing roads within the Rights-of-Way where practicable. If not practicable and if relocation of the road granted herein over and across the Rights-of-Way or portion thereof, is deemed necessary by Grantee, or if a road or portion thereof, does not exist and if construction of a road granted herein over and across the Rights-of-Way or portion thereof, is deemed necessary by Grantee, Grantee shall seek the prior written approval of Grantor, which approval shall not unreasonably be withheld or delayed. Such a request shall specify the proposed construction of the road and the design criteria to be applied to the road. If approved by Grantor any such proposed road or portions thereof, may be constructed by Grantee at its sole expense, subject to



all applicable laws, ordinances and regulations and to any reasonable restrictions, construction techniques and construction materials as required by Grantor. Such constructed road or portions thereof, shall become the property of Grantor and then be deemed to be "Rights-of-Way" and governed by the provisions of this Grant.

(8) Gravel Option: Grantee shall have the option of acquiring gravel without cost to Grantor (to the extent gravel is available; and Grantor has sufficient gravel to meet Grantor's own needs) from pit(s) located upon Grantor's land contiguous to a portion of the Rights-of-Way with the prior written permission of Grantor:

(i) at no charge to Grantee, if for the maintenance or improvement of the roads within the Rights-of-Way located upon land of Grantor; or

(ii) at a fair market value charge to Grantee, if for the construction of roads within the Rights-of-Way located upon land of Grantor; or for construction, maintenance or improvement of roads located upon land of Grantee; the quantity and fair market value of the gravel shall be agreed upon between the parties prior to removal of gravel. In the absence of a price agreement, the price shall be deemed to be the average price at which Grantor has, according to available records, purchased or sold gravel of similar grade within the previous one year period.

(9) Notice and Governmental Approval: Grantee shall not perform any construction, reconstruction, relocation, improvement or maintenance on the Rights-of-Way or gravel extraction on land of Grantor without thirty (30) day prior written notice to Grantor. It is specifically understood and agreed that Grantee, unless otherwise mutually agreed upon, shall

have the full responsibility of giving notification or obtaining any and all Federal, State or local governmental approvals, permits, authorizations, or licenses. Grantee shall fully comply with all laws, rules, regulations and requirements of any and all Federal, State or local government, authority, agency, commission or regulatory body, insofar as any of the same may apply to the use of the land for the purposes herein granted and particularly (but without limitation) as such laws, rules, regulations, and requirements may relate to protection of the environment, water and air, land use, and the prevention of forest fires. Grantee shall not commence any construction, reconstruction, relocation, improvement or maintenance on the Rights-of-Way or gravel extraction on land of Grantor until after Grantee has given such notification and applied for and obtained any such governmental approvals, permits, authorization, or licenses required for such action and copied same to Grantor, if any. Any application of chemicals on land of Grantor shall be with the prior written approval of Grantor. Grantee shall hold Grantor harmless for any and all claims, exactions, penalties, or legal actions resulting from acts by or for Grantee to which this provision applies.

(10) Prudent Use: If use of the Rights-of-Way by Grantee or its invitees results in damage thereto arising from accidents, negligence or use in a manner not consistent with use by a reasonably prudent long-term user, Grantee shall be solely responsible for repairing such damage promptly.

(11) Reserved Timber: Grantor reserves the right to all timber now growing or which may hereafter grow on the Rights-of-Way, provided Grantee shall have the right to cut and remove timber from the Rights-of-Way to the extent necessary for the construction, reconstruction, improvement, maintenance and snowplowing of the roads. Said timber, unless

otherwise agreed, shall be cut into standard merchantable lengths and bunched or piled at the Rights-of-Way edge for disposal by Grantor.

(12) Transfer: Grantor may grant to others easements in common with Grantee.

This Grant may be assigned or transferred only as follows:

(A) Reservation of Grantor's Right to Transfer Its Title.

Grantor may transfer title to any part of the property over which a portion of the Rights-of-Way is located, subject to the terms of this Grant. Upon such transfer, the obligations of Grantor hereunder with respect to that portion of the Rights-of-Way shall cease and shall devolve upon Grantor's successors in title.

(B) Assignment/Transfer by Grantee.

The rights of Grantee hereunder shall be appurtenant to the lands within specific townships currently owned by Grantee, or in the case of Lower Enchanted to be conveyed to Grantee by Indenture of even date herewith, as indication in the following table:

| Rights-of-Way Across Grantor's Lands (Servient Estate) in |                    | Grantee's Benefitted Lands (Dominant Estate)                       |
|-----------------------------------------------------------|--------------------|--------------------------------------------------------------------|
| Lower Enchanted (T2R5 BKP WKR)                            | are appurtenant to | Lower Enchanted (T2R5 BKP WKR)                                     |
| Carrying Place Plt. (T1R3 BKP WKR)                        | are appurtenant to | Carrying Place Plt. (T1R3 BKP WKR) & Carrying Place (T2R3 BKP WKR) |

Said Rights may be assigned only in connection with the sale or transfer of all or any substantial part of such lands. Upon such transfer, the obligations of Grantee hereunder with respect to that portion of the Rights-of-Way shall cease and shall devolve upon Grantee's successors in title.



(13) Indemnification:

(A) Grantee's Use of Rights-of-Way, Indemnity: Grantee and its successors and assigns with respect to the rights herein granted, by acceptance of this Deed, agree to hold Grantor harmless from and indemnify Grantor against any and all claims, demands, expenses, judgments, and awards asserted against, incurred by or imposed upon Grantor arising in any manner in connection with claims made by Grantee, its employees, agents, independent contractors and invitees, arising out of Grantee's use, construction, or maintenance of the road or other rights under this Grant; this obligation is absolute notwithstanding acts, omissions or negligence of Grantor. To the extent necessary to give effect to this obligation to indemnify Grantor and hold Grantor harmless, Grantee expressly waives any immunity or exemption from liability for the personal injury or death of Grantee's employees that may exist under, or any right to receive contribution from Grantor created by the workers' compensation laws of Maine. This provision shall not apply to concurrent use of Rights-of-Way as described in 13 (C) below.

(B) Grantor's Use of Rights-of-Way, Indemnity: Grantor, by giving this Deed, agrees to hold Grantee harmless from and indemnify Grantee against any and all claims, demands, expenses, judgments and awards asserted against, incurred by or imposed upon Grantee arising in any manner in connection with claims made by Grantor, its employees, agents, independent contractors, and invitees, arising out of Grantor's use, construction or maintenance of the road or

other rights reserved under this Grant; this obligation is absolute notwithstanding acts, omissions, or negligence of Grantee. To the extent necessary to give effect to this obligation to indemnify Grantee and hold Grantee harmless, Grantor expressly waives any immunity or exemption for liability for the personal injury or death of Grantor's employees that may exist under, or any right to receive contribution from Grantee created by the workers' compensation laws of Maine. This provision shall not apply to concurrent use of Rights-of-Way as described in 13 (C) below.

(C) Concurrent Use of Rights-of-Way: In the event of concurrent use of the Rights-of-Way resulting in any event which gives rise to one or more claims of liability on the part of either or both parties, then each party will be responsible for that percentage or proportion of damages assigned to it in the judgment establishing such liability; provided, that in the event of such concurrent use, each party shall be solely responsible for, and shall be required to, indemnify the other party against and hold the other party harmless from any claim by any agent, licensee, or independent contractor of the party so indemnifying.

To the extent necessary to give effect to this obligation to indemnify Grantee and hold Grantee harmless, Grantor expressly waives any immunity or exemption for liability for the personal injury or death of Grantor's employees that may exist under, or any right to receive contribution from Grantee created by the workers' compensation laws of Maine.

(14) Definitions: "Construction" or "construct" shall mean undertaking the work necessary to build, shape, cut, grade, level, fill, drain, install and form the Rights-of-Way or



portions thereof, road, road surface, bridge, culvert, ditch or other appurtenant facility or structure to provide satisfactory and safe road services for the purposes herein authorized in compliance with all applicable laws and regulations.

"Maintenance" or "maintain" shall mean undertaking the work necessary to preserve or keep, as nearly as possible, the Rights-of-Way or portions thereof, road, road surface, bridge, culvert, ditch or other appurtenant facility or structure in a condition no less than substantially the equivalent to their condition immediately preceding the commencement of a use, or as subsequently improved, to provide satisfactory and safe road services for the purposes herein authorized in compliance with all applicable laws and regulations. Such terms shall further mean and include dust control, the control of roadside brush, the plowing of snow from, and the sanding of the roadway within the Rights-of-Way.

"Improvements" or "improve" shall mean the reconditioning or replacing of the Rights-of-Way or portions thereof, road, road surface, bridge, culvert, ditch or other appurtenant facility or structure to a standard higher or greater than that prevailing at the time immediately preceding the commencement of use, or as subsequently improved.

(15) Not A Public Way: Notwithstanding any other provision of this Grant, the Rights-of-Way may not be used as a "public way", nor does this Grant entitle the general public to use the Rights-of-Way or to operate any vehicle of any kind on any portion of the Rights-of-Way.

(16) Benefited Parties: This Grant shall be binding upon and inure to the benefit of the parties hereto and their respective successors and assigns, to the extent any such assignment has been authorized in this Grant. For the purposes of this Grant, "Grantor" shall mean and include Grantor's successors and assigns, and their respective officers, employees, servants,

agents, licensees, contractors, permittees and lessees, and "Grantee" shall mean and include Grantee's successors and those assigns authorized by Paragraph 12(B) to succeed to the rights herein granted, and their respective officers, employees, servants, agents, licensees, contractors, permittees and lessees.

(17) Understanding: This Grant, (and the Exhibit(s) attached hereto) set forth the final and complete understanding and agreement of the parties concerning the subject matter hereof. It is understood and agreed that there are no representations made or implied with respect to the Rights-of-Way, the properties subject to this Grant, or the Grant itself, whether arising in law or in equity, other than as provided in this Grant. This Grant may be modified only by a writing signed and acknowledged by both parties, duly authorized, and recorded in the Somerset County Registry of Deeds.

Except as specifically otherwise expressed herein, wherever Grantor has reserved the right to approve or authorize any act or thing, Grantor shall have the right to withhold such approval or authorization for any reason or for no reason.

IN WITNESS WHEREOF, the said **Central Maine Power Company** has caused this deed to be executed upon its behalf by David T. Flanagan, its President, thereunto duly authorized, this 22nd day of December, 1995.

**Central Maine Power Company**

Laure E. Halligan  
Witness

By:

David T. Flanagan  
David T. Flanagan  
Its President



STATE OF MAINE  
Hennebec, SS.

Then personally appeared before me the said David T. Flanagan and acknowledged the foregoing instrument to be his free and voluntary act and deed in his said capacity and the free and voluntary act and deed of Central Maine Power Company, this 21 day of December, 1995.

Karla E. Swasey  
Notary Public, Maine

My Commission Expires

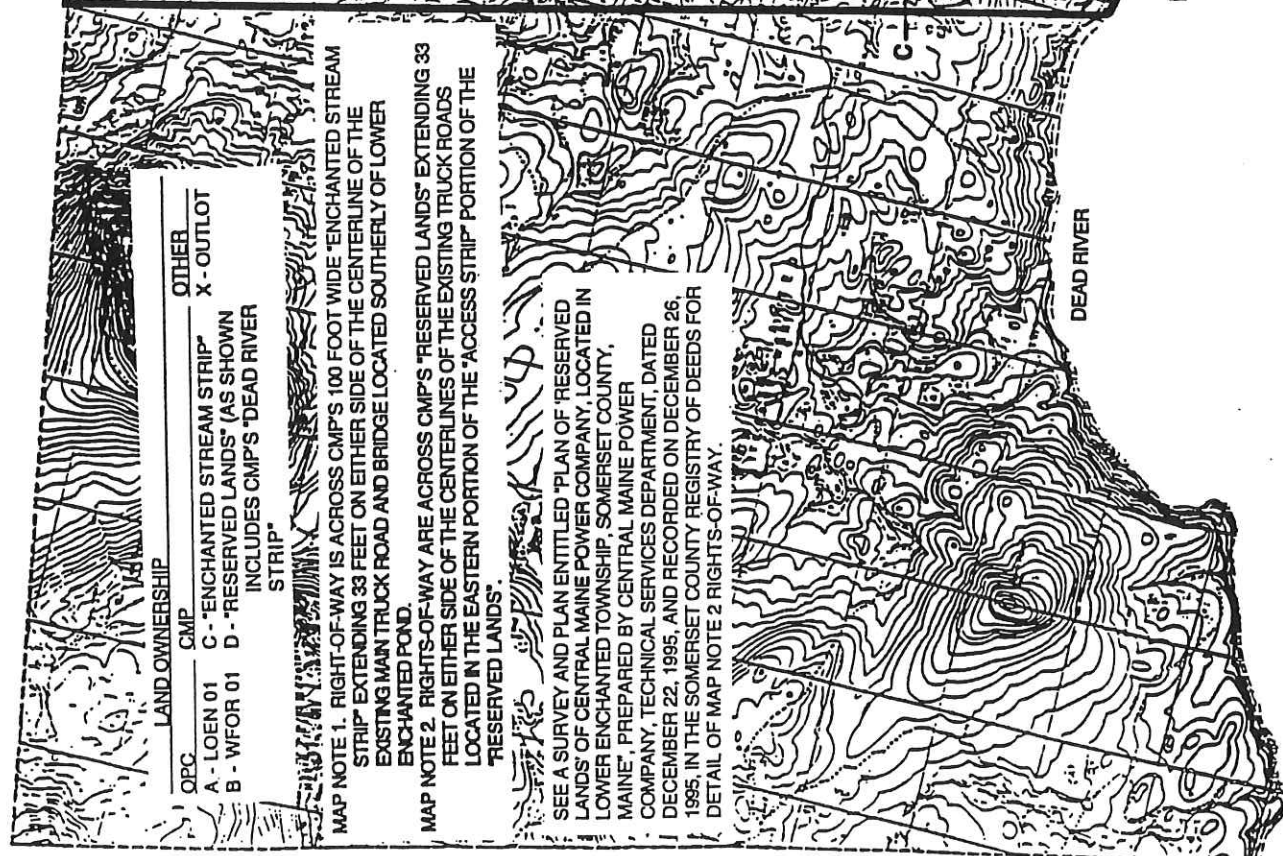
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KARLA E. SWASEY  
Notary Public, Maine  
My Commission Expires April 1, 2001

SEAL



RIGHT-OF-WAY EASEMENT DEED - EXHIBIT A.1  
CENTRAL MAINE POWER COMPANY TO OXFORD PAPER COMPANY



| LAND OWNERSHIP |                                 | OTHER                             |
|----------------|---------------------------------|-----------------------------------|
| OPC            | CMP                             |                                   |
| A - LOEN 01    | C - "ENCHANTED STREAM STRIP"    | X - OUTLOT                        |
| B - WFOR 01    | D - "RESERVED LANDS" (AS SHOWN) |                                   |
|                |                                 | INCLUDES CMP'S "DEAD RIVER STRIP" |

MAP NOTE 1. RIGHT-OF-WAY IS ACROSS CMP'S 100 FOOT WIDE "ENCHANTED STREAM STRIP" EXTENDING 33 FEET ON EITHER SIDE OF THE CENTERLINE OF THE EXISTING MAIN TRUCK ROAD AND BRIDGE LOCATED SOUTHERLY OF LOWER ENCHANTED POND.

MAP NOTE 2. RIGHTS-OF-WAY ARE ACROSS CMP'S "RESERVED LANDS" EXTENDING 33 FEET ON EITHER SIDE OF THE CENTERLINES OF THE EXISTING TRUCK ROADS LOCATED IN THE EASTERN PORTION OF THE "ACCESS STRIP" PORTION OF THE "RESERVED LANDS".

SEE A SURVEY AND PLAN ENTITLED "PLAN OF 'RESERVED LANDS' OF CENTRAL MAINE POWER COMPANY, LOCATED IN LOWER ENCHANTED TOWNSHIP, SOMERSET COUNTY, MAINE", PREPARED BY CENTRAL MAINE POWER COMPANY, TECHNICAL SERVICES DEPARTMENT, DATED DECEMBER 22, 1995, AND RECORDED ON DECEMBER 26, 1995, IN THE SOMERSET COUNTY REGISTRY OF DEEDS FOR DETAIL OF MAP NOTE 2 RIGHTS-OF-WAY.

LOWER ENCHANTED WEST FORKS PLT.  
T2R5 BKPWKFR

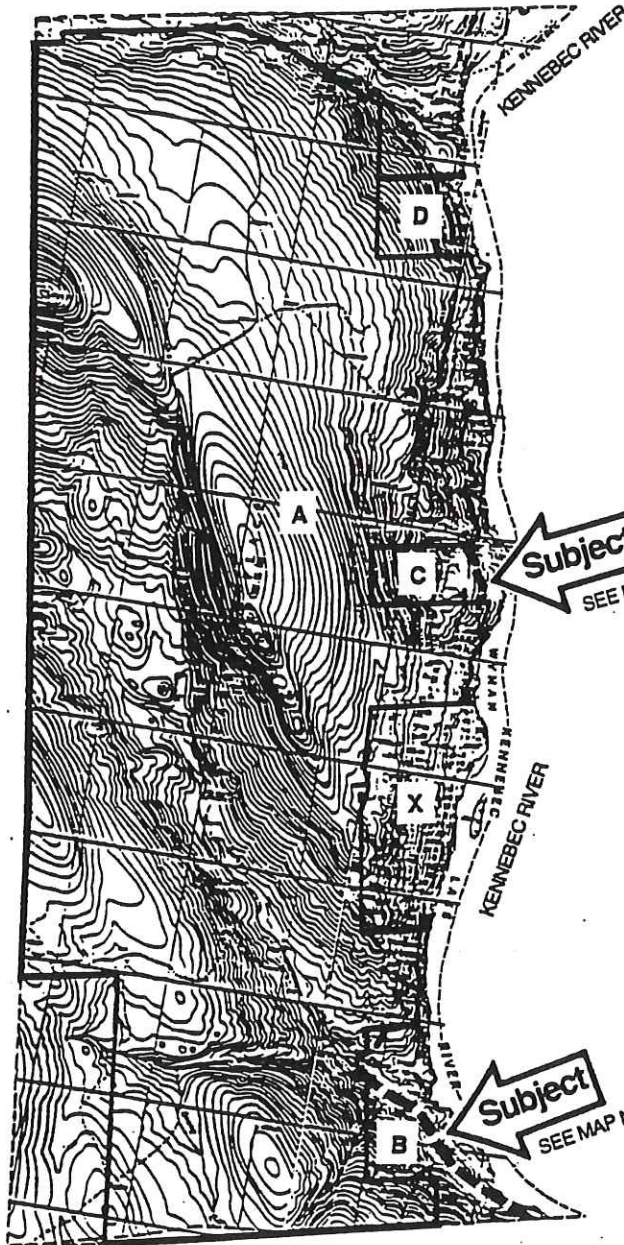
COMPOSITE OF PORTIONS OF VARIOUS USGS 7.5  
TOPOGRAPHIC MAPS, PROVISIONAL ED. 1989

0 1 MILE  
LB & KF 12/95

SOMERSET COUNTY, MAINE



RIGHT-OF-WAY EASEMENT DEED - EXHIBIT A.2  
CENTRAL MAINE POWER COMPANY TO OXFORD PAPER COMPANY



MAP NOTE 1. RIGHTS-OF-WAY ARE ACROSS CMP'S LOTS 1 & 2 EXTENDING 33 FEET ON EITHER SIDE OF THE CENTERLINES OF THE EXISTING TRUCK ROADS.  
MAP NOTE 2. RIGHT-OF-WAY IS ACROSS CMP'S BELOW 580' ELEV. LOTS 6 & 7, & LOT 8, EXTENDING 33 FEET ON EITHER SIDE OF THE CENTERLINE OF THE EXISTING TRUCK ROAD.

LOTS ARE AS INDICATED ON THE PLAN AND SURVEY OF THE TOWN OF CARRYING PLACE PLANTATION.

RECEIVED SOMERSET SS  
RECORDED FROM ORIGINAL

95 DEC 26 PM 12:28

*Margaret P. Libby*  
REGISTER

| LAND OWNERSHIP |                                                                        |
|----------------|------------------------------------------------------------------------|
| OPC            | CMP                                                                    |
| A - T1R3 01    | B - LOTS 1 & 2; & BELOW 580' ELEV. LOT 3                               |
|                | C - BELOW 580' ELEV. LOTS 6 & 7; LOT 8; & BELOW 580' ELEV. LOTS 9 - 14 |
|                | D - LOTS 15 & 16                                                       |

OTHER  
X - OUTLOT



## TRAIL USE LEASE AGREEMENT

**THIS TRAIL USE LEASE AGREEMENT** (the "**Agreement**") is made this 31<sup>st</sup> day of MARCH, 2008, by and between **CENTRAL MAINE POWER COMPANY**, a Maine corporation having its principal place of business at 83 Edison Drive, Augusta, ME 04336 ("**CMP**") and **WESTERN MOUNTAINS CHARITABLE FOUNDATION**, a Maine not-for-profit corporation with a mailing address of 308 North Main Street, Kingfield, Maine 04947, ("**WMCF**"). CMP hereby grants to WMCF the right to use, for the purposes described below, the following described premises under the following conditions:

### Section One Premises

For the purpose of this Trail Use Lease Agreement the Premises are a certain strip of land, being about twelve (12) wide across four noncontiguous parcels and further described as follows and shown on Exhibit A attached hereto and made a part hereof. Trail 1, 2, 3 and 4 are each the "**Premises**" and collectively, the "**Premises**." All Exhibits referenced herein are incorporated by reference and made a part hereof.

#### Trail 1-Flagstaff Area

A trail located in the Towns of Carrying Place Town Twp, T2 R3 BKP, WKR and Dead River Twp, T3 R3 BKP, WKR, Somerset County, Maine, located easterly of the westerly line and lying above the 1150-foot elevation contour line. More particularly described as a certain strip of land, except for crossing roads, being twelve (12) feet wide, a distance of 31,400', containing about 8.3 acres, and being shown on Exhibit A as Trail 1 ("**Trail 1**") and as shown on Exhibit B and described in Exhibits B2 and B-3 attached hereto and made a part hereof. Trail 1 is subject to the terms and conditions of a Lease between CMP and Western Mountains Foundation, dated July 1, 2005 ("**Lease 1**") and recorded by Memorandum of Lease in Book 3700, Page 282 in said Registry and any amendments thereof. The term for this Agreement shall run consecutively with the term of said Lease. The land subject to the lease is shown on Exhibit B as "**CMP Flagstaff Lease Area**" and described in Exhibit B-1.

Also included in this Agreement are the rights to use certain easements appurtenant to Trail 1 and reserved by CMP in a deed to FPL Energy Maine Hydro LLC dated April 7, 1999 and recorded in Book 2540, Page 1 in said Registry.

#### Trail 2-Grand Falls Dam Lot

A trail located in T3 R4, BKP, WKR Spring Lake Township, Somerset County, Maine, being a portion of the Grand Falls Dam Lot, so called, in the north part of said Township, lying on both sides of the Dead River. That certain strip of land, except for crossing roads, being twelve (12) feet wide, a distance of about 4,550 feet, containing about 1.25 acres, and being shown on Exhibit A as Trail 2 ("**Trail 2**") and as shown on Exhibit C and described in Exhibit C-1, attached hereto and made a part hereof. Trail 2 is subject to the terms and conditions of a Lease between CMP and Western Mountains Foundation, dated July 1, 2005 ("**Lease 2**") and recorded by Memorandum of Lease in Book 3700, Page 279 in said Registry and any amendments thereof. The term for this Agreement shall run consecutively with the term of said Lease.

Trail 3-Enchanted Stream Lot

Four noncontiguous trails located in T2 R5 BKP WKR Lower Enchanted Township, Somerset County, Maine as more particularly described as a certain strip of land, except for crossing roads, each trail being twelve (12) feet wide, a distance of about 6,570 feet, containing about 1.8 acres, and being shown on Exhibit A as Trail 3 ("**Trail 3**") and as shown on Exhibit D and described in Exhibit D-1, attached hereto and made a part hereof.

Trail 4-Durgin Brook Lot

A trail located in West Forks Plantation, Somerset County, Maine, and more particularly described as a certain strip of land except for crossing roads, being twelve (12) feet wide, a distance of about 2,070 feet, containing about .57 acres, and being shown on Exhibit A as Trail 4 ("**Trail 4**") and as shown on Exhibit E and described in Exhibit E-1, attached hereto and made a part hereof.

### **Section Two Term and Rent**

The initial term of this Agreement shall commence on the date of execution as stated in paragraph one and shall expire June 30, 2025 unless sooner terminated as provided herein. On July 10, 2010 and every five years thereafter for the Initial Term and any subsequent extension thereof, CMP and the WMCF will negotiate to extend the lease for a period of twenty (20) years ("**Subsequent Term**"). The Subsequent Term will begin in the year in which the Subsequent Term is agreed to (e.g. the fifth, tenth, fifteenth year, etc.) and end on July 11<sup>th</sup> twenty years thereafter. In no event shall the term be short of this Agreement, whether Initial or Subsequent, be shorter than any term set forth in the Lease 1 or Lease 2. The Parties intend that the terms of this Agreement and Lease 1 and Lease 2, be coterminus.

CMP shall receive recognition for its contribution in granting use of the Premises on signs erected on the Premises and in printed material that publicizes the Trail. In the event CMP provides WMCF with recognition signs, WMCF will place them in appropriate locations along the Trail.

No payment or consideration other than the mutual covenants contained herein shall be paid for this Agreement.

### **Section Three Leasehold Mortgages**

A. WMCF and every successor and assign of WMCF is hereby given the right by CMP in addition to any other rights herein granted, without CMP's prior written consent, to mortgage its interests in the Lease, or any part or parts thereof, on such terms and conditions as WMCF may desire under one or more leasehold mortgages and to enter into any and all extensions, modifications, amendments, renewals, replacements and refinances thereof as WMCF may desire and to assign this Lease, or any part or, parts thereof, and any sublease or subleases as collateral security for such mortgage(s), upon the condition that all rights acquired under such mortgages shall be subject to each and all of the covenants, conditions and restrictions set forth in this Lease, and to all rights and interests of CMP herein, none of which covenants,



conditions or restrictions is or shall be waived by CMP by reason of the right given so to mortgage such interest in this Lease, except as expressly provided herein. No leasehold mortgage given by WMCF under the provisions of this Section shall be deemed to be an assignment of this Lease so as to relieve WMCF of its obligations and liabilities under this Lease or to require the assumption of said obligations and liabilities by the holder(s) of such mortgage.

B. CMP agrees that in the event of termination of this Lease by reason of any default by WMCF that the mortgagee will have the right to continue this Lease in effect, provided:

- i. Said mortgagee(s) or its nominee(s) shall make payment to CMP of sums then due to CMP under this Lease.
- ii. Said mortgagee(s) or its nominee(s) shall pay to CMP at the time of the request to continue this Lease in effect any and all sums which would at the time of the execution and delivery thereof be due pursuant to this Lease but for such termination, and in addition thereto, any expenses, including reasonable attorneys' fees, to which CMP shall have been subjected by reason of such default.
- iii. Said mortgagee(s) or its nominee(s) shall perform and observe all covenants herein contained on WMCF's part to be performed and shall further remedy any other conditions which WMCF under the terminated lease was obligated to perform under the terms of this Lease.

#### **Section Four Specific Use**

WMCF's use of the Premises shall not endanger health, create a nuisance, or be incompatible with CMP's use of the Premises in its business as a public utility.

WMCF may only use the Premises for a twelve (12) foot wide paved or unpaved public recreational Trail ("Trail"). The Trail shall be designed and designated so that it will not be used by motorized vehicles such as snowmobiles, ATV's, dirt bikes and other off-road vehicles. This use restriction is not intended to preclude use by motorized wheelchairs and by motorized vehicles engaged in construction, maintenance or repair of the Trail, as provided below. The Premises shall not be used for camping or for any other use without prior written approval from CMP.

WMCF may install improvements such as culverts, small bridges, safety barriers and signs, provided that they do not interfere with CMP's operations, as determined solely by CMP. WMCF, or its agents, may use necessary motorized vehicles for installation of Trail improvements and for Trail maintenance as outlined in Section Six herein.

WMCF's rights under this Agreement are subject to any rights CMP has granted to third parties, even if such rights interfere with WMCF's use of the Premises. CMP also reserves the right to grant rights to third parties for use of all or part of the Premises, even if such rights interfere with WMCF's use of the Premises. However, CMP and its assignees shall work with WMCF to minimize the impact on the Trail, and shall undertake reasonable care not to disturb or damage the Trail or its components. Neither CMP nor CMP's assignees shall be liable to WMCF for any damage to WMCF's property or interference with WMCF's use of the Premises.

CMP may close or relocate the Trail, or portions thereof, on a temporary basis to maintain, repair, replace, or rebuild its utility facilities or to perform necessary land management. WMCF agrees to relocate the trail upon reasonable notice by CMP provided an alternative location acceptable to WMCF is available on CMP lands.

Upon written approval of the Trail location and design by CMP, WMCF shall provide CMP with a plan showing centerline location of the Trail, all improvements to be constructed by WMCF, and the location of CMP's existing poles and guy anchors, if any, located within the above described parcel of CMP ("**Trail Plan**"). The Trail Plan shall be attached and become part of this Agreement.

#### **Section Five Approval and Timing**

Upon execution of this Agreement, WMCF shall promptly seek and make reasonable effort to obtain all necessary federal, state and local approvals, Agreements and permits. WMCF shall not undertake any construction or installation until WMCF has procured all necessary permits or governmental approvals. WMCF also will assure that its use of the Trail is in compliance with all applicable regulations, including, but not limited to, Department of Environmental Protection wetland regulations.

Prior to the cutting or trimming of any trees on the Premises, WMCF will notify appropriate CMP Vegetation Management personnel and subsequently comply with all requirements and conditions of said tree work and removal as set forth by said CMP representatives.

No signs, Trail markers, reflectors, or notices of any kind will be attached to CMP structures.

No portion of said Trail shall pass between poles on a multi-pole structure, or within 15' of any pole or guy wire. However, if in its final design and layout, any portion of the Trail is found to pass within 15' of a transmission pole or guy wire, the WMCF must construct barriers between said pole or guy wires and the Trail which are adequate to protect them from damage. Said barriers shall be approved with respect to design, composition, and installation in writing by appropriate CMP representatives prior to their installation. The construction and maintenance of said barriers, as well as any relocation by CMP of its transmission poles or guy wires to accommodate the provisions of this Agreement shall be at the WMCF's sole cost and expense.

Prior to any excavation of the Premises, WMCF will notify the Dig Safe Call Center at 1-888-DIG-SAFE and comply with the provisions of both the Maine Dig Safe Statute, M.R.S.A., Title 23, Section 3360-A and the Overhead High-Voltage Line Safety Act, M.R.S.A., Title 35A, Section 751, et seq., Chapter 7-A. In the event that WMCF does not receive any necessary permits or approvals within two (2) years of the commencement of this Agreement, and the parties have not previously agreed to an extension of this time frame, this Agreement shall be null and void and CMP and WMCF shall have no further obligations to each other with respect to the subject matter of this Agreement, except for WMCF's obligations under Section Ten below.



### **Section Six Waste**

WMCF shall take all reasonable precautions to ensure that construction, operation and maintenance of the Trail and all associated uses will occur in a manner that will protect the scenic, recreational, and environmental values of the Premises.

WMCF will not make or suffer any waste of the Premises.

### **Section Seven Operation and Maintenance**

WMCF shall perform or arrange for the performance of routine and major maintenance and repair of all improvements related to the construction and use of the Trail located on the Premises, so that they remain orderly and safe. WMCF shall also take reasonable steps to keep the Premises free of litter, such as cans and paper goods. WMCF shall also maintain the Trail in a safe condition, including grading, bridge and culvert construction, maintenance of vegetation affecting the Trail and maintenance of all non-CMP mandated signs. WMCF shall, through its regular publications to its members and public notices relating to the Premises, inform its members and the public of the uses of the Premises permitted under this Agreement. WMCF shall also, through its stewardship program, make reasonable efforts to enforce compliance with such uses and prevent harm or damage to the Premises, including dumping.

CMP may periodically inspect the Premises to determine if maintenance may be necessary and shall notify WMCF within a reasonable time period after discovery by CMP of any necessary maintenance to be performed by WMCF.

In event that WMCF fails promptly to perform its obligations under this Section, CMP may, fourteen (14) days after mailing written notice to WMCF, perform the obligation and invoice WMCF for the reasonable cost of performing the obligation, which costs WMCF shall promptly pay. CMP is under no obligation to perform WMCF's obligations.

### **Section Eight Requirements of Law**

WMCF and CMP shall comply with all governmental laws, orders, ordinances and regulations and with any lawful order of any public officer or officials.

### **Section Nine Surrender of Premises**

Upon expiration of the term or other termination of this Agreement, whether by reason of lapse or time or WMCF's default or otherwise, WMCF shall quit and surrender the Premises, together with all improvements thereon, to CMP in as good order and condition as they are in or may be put into by CMP or WMCF, except for ordinary wear and tear.

### **Section Ten Insurance**

WMCF covenants and agrees, at its sole cost and expense, to obtain, keep, and maintain in full force and effect for the term of this Agreement and any extension thereof for the mutual benefit of CMP and WMCF, a comprehensive general liability insurance policy against claims for damage to persons and property arising out of the use and occupancy of the Premises or any part or parts thereof, with a combined single limit of One Million Dollars (\$1,000,000.00) with no more than a Ten Thousand Dollar (\$10,000.00) deductible.

All insurance required under this Section shall name CMP as an additional insured and shall be issued by an insurer rated B+13 by the latest Best's rating guide. WMCF shall provide CMP with a Certificate of Insurance prior to the commencement of this Agreement. Such Certificate shall state that no material change or cancellation of the insurance coverage can be effective unless and until ten (10) days prior written notice has been given to CMP for cancellation for non-payment and thirty (30) days prior written notice for all other reasons for change or cancellation. Should any policy be canceled during the term of this Agreement and WMCF fails to immediately procure equivalent insurance, CMP shall have the right, at its option but without any duty to do so, to: (1) cancel this Agreement at the lapse of the policy; or, (2) to procure such insurance and to pay the premiums therefore, and all such premiums paid by CMP together with interest from the time of payment until repaid by WMCF, shall be repaid to CMP on demand as additional rent, and, without limiting CMP's remedies, WMCF's failure to repay the same, shall constitute a default under this Agreement.

### **Section Eleven – Release Indemnification**

WMCF is fully familiar with the physical condition of the Premises. CMP has made no representations of whatever nature in connection with the condition of the Premises and WMCF accepts the Premises "as is". Without limiting the foregoing, CMP does warrant and represent that it has sufficient interest in all or any part of the Premises for WMCF to exercise the rights described herein. CMP shall not be liable for any latent or patent defects therein.

Neither CMP, nor its parent company or their affiliates, and its and their directors, officers, employees, agents, contractors, successors and assigns shall be liable for, and WMCF hereby releases them from, all claims of any kind or nature, including but not limited to claims for loss of life, personal injury or damage to property sustained by WMCF or any person claiming through WMCF resulting from any accident, occurrence or condition in or upon the Premises or related to this Agreement, except for damage caused solely by negligent acts or omissions of CMP.

WMCF shall be responsible for any and all damage and related costs caused by the existence of any toxic or hazardous matter, substance or waste caused or allowed, with knowledge of the WMCF, to be brought onto the Premises by WMCF or its employees, members, officers, directors, contractors, agents or invitees during the term of this Agreement or any extension thereof, unless placed there by CMP or occurring on the Premises prior to the date hereof, and shall indemnify and hold harmless CMP and its parent company or their affiliates, and its and their directors, officers, employees, agents, contractors, successors and assigns from and against all claims, actions, damages, liability and expense, including attorneys' fees, arising from or out of the existence of such hazardous matter, substance or waste.



Each party shall be liable for their own attorneys' fees in litigating any matter arising between the parties concerning the enforcement or interpretation of this Agreement.

The provision of this Section shall survive cancellation or termination of this Agreement.

### **Section Twelve Default**

WMCF shall be deemed to be in default under the Agreement if it fails to fully comply with any term or condition of this Agreement within thirty (30) days after receipt of written notice from CMP of any such failure to correct the conditions specified in the notice; provided that if such condition cannot reasonably be cured within thirty (30) days, WMCF shall not be in default if it promptly commences the cure and continues diligently. However, WMCF may be required to correct the condition causing the breach in less than thirty (30) days if necessary to protect the public health or safety, abate a nuisance, or prevent damage to the Premises.

If an event of default occurs as described above, CMP shall have the option to pursue one or more of the following remedies, without notice or demand, in addition to any other remedies provided in this Agreement, in equity or at law:

- a. terminate this Agreement; and
- b. recover from WMCF all damages proximately resulting from the breach, which damages shall be deemed to include without limitation, damages to the Premises, the cost of recovering the Premises, and CMP's reasonable attorney's fees necessary to enforce obligations under this Agreement.

### **Section Thirteen Notices**

Any notice under this Agreement shall be in writing and shall be deemed to be delivered when mailed by registered or certified mail, postage prepaid, addressed to the address of such party set forth below.

WMCF

Western Mountains Charitable Foundation  
375 Main Street  
Kingfield, Maine 04947  
Attn: Larry Warren

CMP

Central Maine Power Company  
CMP Real Estate Services  
83 Edison Drive  
Augusta, ME 04336

Either party may change its above address by giving notice of the change to the other party of such change of address to become effective for all purposes hereunder three (3) days after such notice is given.

#### **Section Fourteen Contact Person**

In order to facilitate communication between CMP and WMCF, each party will designate a contact person for communications necessary under this Agreement other than formal notices, which notices shall be sent in accordance with the written notice provisions of this Agreement.

#### **Section Fifteen No Waiver**

Failure of CMP to complain of any act or omission on the part of the WMCF, no matter how long the same may continue, shall not be deemed to be a waiver by said CMP of any of its rights hereunder. No waiver by CMP at any time, express or implied, of any breach of any provision of this Agreement, shall be deemed a waiver of such provision or of a subsequent breach of the same of any other provision.

#### **Section Sixteen Assignment**

WMCF shall not assign this Agreement or its rights hereunder nor sublet the Premises or any part thereof without the prior written consent of CMP.

#### **Section Seventeen Authorization**

WMCF hereby warrants and represents that the execution of this Agreement and the carrying out of all acts required of WMCF by the terms of this Agreement have been properly and effectively approved and authorized by WMCF in accordance with the Maine State Constitution, the Maine Revised Statutes, and the Articles of Incorporation and Bylaws of WMCF.

#### **Section Eighteen Miscellaneous Provisions**

If any covenant, provision or condition of this Agreement or the application thereof to any person or circumstances shall be declared to any extent to be invalid or unenforceable, the remainder of this Agreement, or application thereof shall remain in full force and effect.

This Agreement shall inure to and be binding upon the respective successors and permitted assigns of the parties.

No waivers, alterations or modifications of this Agreement shall be valid unless in writing and duly executed by both parties.

This Agreement shall be governed by and constructed in accordance with the laws of the State of Maine.



The captions appearing in this Agreement are inserted only as a matter of convenience and in no way define, limit, construe or describe the scope or intent of the paragraphs of this Agreement or in any way affect this Agreement.

The covenants, provisions and conditions contained in this Agreement constitute the entire agreement between the parties and shall supersede all previous communications, representations, or agreements either verbal or written between the parties with respect to the subject matter of this Agreement.

**IN WITNESS WHEREOF**, the parties have caused their duly authorized representatives to execute this Agreement on their behalf as of the date first written above.

**CENTRAL MAINE POWER COMPANY**

By: Kenneth H. Freye  
Kenneth H. Freye  
Manager, Real Estate Services

**WESTERN MOUNTAINS CHARITABLE FOUNDATION**

By: Larry Warren  
Name: LARRY WARREN  
Its PRESIDENT

STATE OF MAINE  
Kennebec, ss.

March 31, 2008

The above named Kenneth H. Freye, Manager, Real Estate Services, personally appeared before me and acknowledged the foregoing Agreement to be his/her free act and deed in his/her said capacity and the free act and deed of said CENTRAL MAINE POWER COMPANY.

Teresa Despres  
Notary Public

SEAL

Notary Public, Maine

Commission Expires August 17, 2013

STATE OF MAINE  
FRANKLIN, ss.

March 28, 2008

The above named LARRY WARREN personally appeared before me and acknowledged the foregoing Agreement to be his/her free act and deed in his/her said capacity and the free act and deed of said WESTERN MOUNTAINS CHARITABLE FOUNDATION.

Barbara Nickerson  
Notary Public

BARBARA NICKERSON

COM. EXP. JUNE 25, 2014

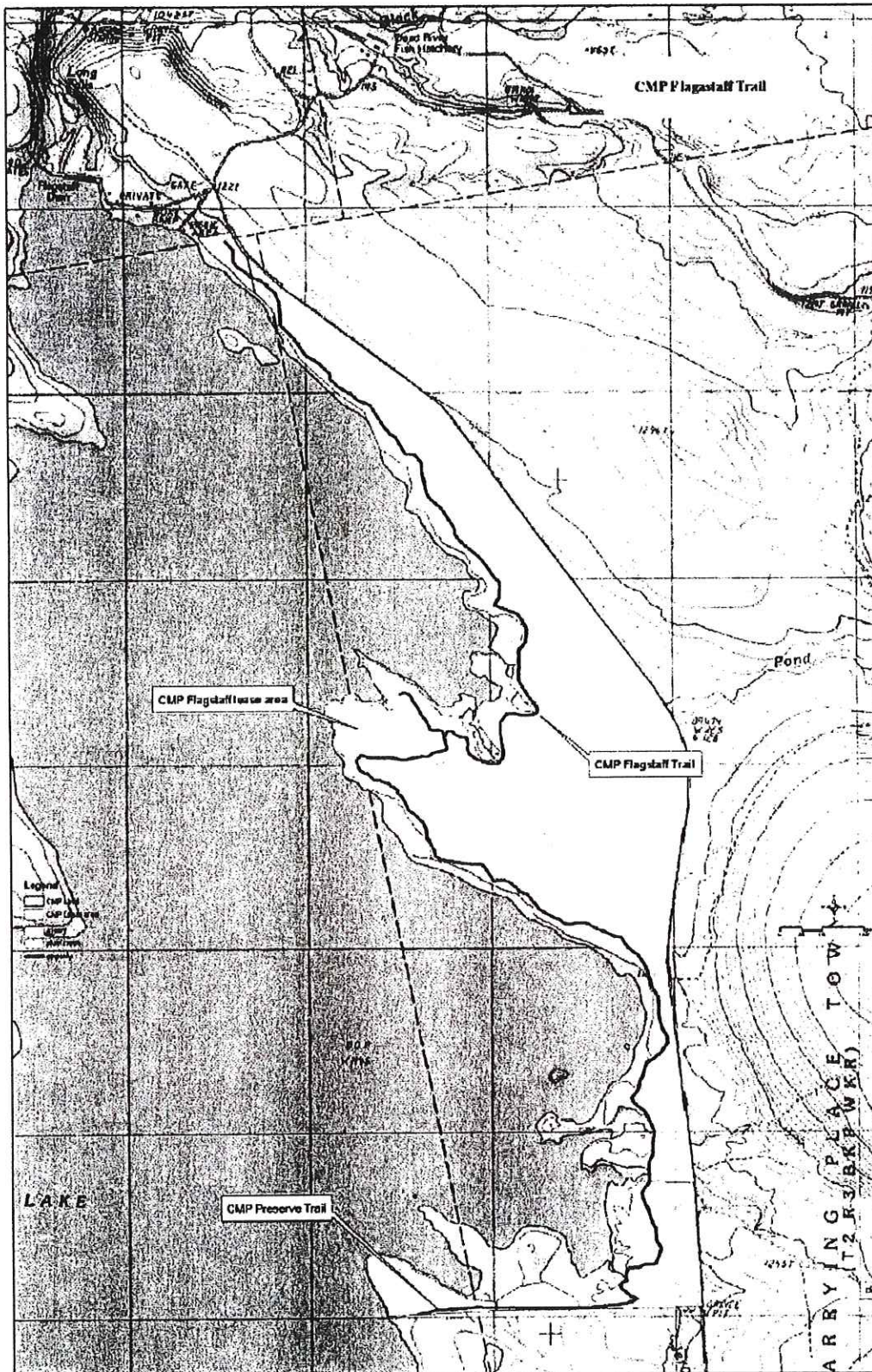


## EXHIBIT A





## EXHIBIT B



**EXHIBIT B-1**

Central Maine Power Company  
Lease to  
Western Mountains Foundation  
75 acres

A certain lot or parcel of land situated on a peninsula on the southeasterly shore of Flagstaff Lake in the Townships of Carrying Place Town (T2 R3 BKP WKR) and Dead River (T3 R3 BKP WKR) in the County of Somerset and State of Maine bounded and described as follows, to wit:

Beginning on the southeasterly shore of Flagstaff Lake on the 1150 foot contour (USGS Datum – NGVD29 FEET) at a point having a north coordinate of N 16,420,852.28 and an east coordinate of E 1,336,550.87 Datum UTM Zone 19 FEET NAD83;

Thence, northerly, easterly and southerly, or as the course may be, along the 1150 foot contour an approximate distance of eight thousand one hundred fifty-five (8155) feet to an unmonumented point located at a north coordinate of N 16,421,547.82 and an east coordinate of E 1,338,451.45 Datum UTM Zone 19 FEET NAD83;

Thence, westerly on a course of S 69°-53'-58" W through land of Central Maine Power Company a distance of two thousand twenty-three and eighty-six hundredths (2023.86) feet to the point and place of beginning. Containing 75 acres of land, more or less.



**EXHIBIT B-2**

## CMP Flagstaff Trail

A certain lot or parcel of land being a lease area twelve (12) feet in width situated easterly of, but not abutting, the southeasterly shore of Flagstaff Lake and westerly of, but not abutting, Long Falls Dam Road in the townships of Carrying Place Town (T2 R3 BKP WKR) and Dead River (T3 R3 BKP WKR), Somerset County, Maine, the centerline of said lease is as follows:

Beginning at an unmonumented point (having a north coordinate of N 16,430,541 and an east coordinate of E 1,333,966 Datum UTM Zone 19 FEET NAD83) located on the southerly line of land leased by the State of Maine;

Thence, southerly through land of Central Maine Power Company on the following courses and distances:

S 46°-00'-18" E two hundred one and seventy hundredths (201.70) feet;  
S 03°-44'-46" E two hundred ten and sixty hundredths (210.60) feet;  
S 31°-22'-23" E one hundred twenty and fourteen hundredths (120.14) feet;  
S 54°-16'-21" E one hundred seventy-five and sixty-six hundredths (175.66) feet;  
S 49°-09'-59" E one hundred thirty-three and ninety-two hundredths (133.92) feet;  
S 72°-30'-43" E one hundred ninety-one and forty-eight hundredths (191.48) feet;  
S 50°-32'-48" E three hundred thirty-eight and fifty-nine hundredths (338.59) feet;  
S 24°-51'-49" E one hundred sixty-nine and fifty-eight hundredths (169.58) feet;  
S 04°-15'-14" E three hundred three and fifty-six hundredths (303.56) feet;  
S 02°-07'-16" E one hundred thirty-five and nineteen hundredths (135.19) feet;  
S 45°-35'-05" E three hundred forty-six and seventy-five hundredths (346.75) feet;  
S 35°-04'-39" E three hundred forty-three and ninety-two hundredths (343.92) feet;  
S 58°-45'-03" E three hundred one and forty-two hundredths (301.42) feet;  
S 45°-50'-33" E two hundred forty and sixty-two hundredths (240.62) feet;  
S 07°-51'-12" E one hundred nine and eighty-six hundredths (109.86) feet;  
S 53°-44'-46" E one hundred sixteen and thirty-four hundredths (116.34) feet;  
S 39°-13'-32" E seventy-nine and twelve hundredths (79.12) feet;  
S 63°-18'-09" E two hundred forty-two and twenty-three hundredths (242.23) feet;  
S 48°-10'-47" E one hundred ninety-one and thirty-five hundredths (191.35) feet;  
S 69°-48'-20" E two hundred thirty-one and ninety-two hundredths (231.92) feet;  
S 29°-56'-18" E two hundred seventy-five and seventy-one hundredths (275.71) feet;  
S 35°-45'-39" E three hundred thirty-six and six hundredths (336.06) feet;  
S 60°-35'-04" E one hundred thirty-four and ninety-nine hundredths (134.99) feet;  
S 28°-31'-06" E one hundred thirty-one and fifty-four hundredths (331.54) feet;  
S 84°-59'-13" E one hundred eighty-three and twenty-three hundredths (183.23) feet;  
S 42°-09'-45" E one hundred ninety-four and forty-one hundredths (194.41) feet;  
S 00°-17'-01" E one hundred sixty-one and seventy-two hundredths (161.72) feet;  
S 10°-08'-09" E one hundred forty-five and fifty-eight hundredths (145.58) feet;  
S 11°-02'-47" E two hundred four and seventy-four hundredths (204.74) feet;  
S 26°-58'-22" E one hundred and sixty-one hundredths (100.61) feet;  
S 51°-38'-55" E two hundred seventy-eight and seventy hundredths (278.70) feet;  
S 33°-22'-51" E four hundred fifty-two and fifty-three hundredths (452.53) feet;  
S 07°-58'-11" W eighty and eighty-four hundredths (80.84) feet;  
S 37°-24'-19" E two hundred five and sixty hundredths (205.60) feet;



S 51°-56'-44" E four hundred twenty-six and zero hundredths (426.00) feet;  
S 37°-03'-52" E one hundred eighty-eight and sixty-two hundredths (188.62) feet;  
S 36°-29'-55" E two hundred seventy-one and eighty-eight hundredths (271.88) feet;  
S 48°-41'-29" E one hundred five and fifty-one hundredths (105.51) feet;  
S 03°-17'-21" W two hundred seventy-nine and six hundredths (279.06) feet;  
S 32°-49'-43" W one hundred forty-seven and sixty-seven hundredths (147.67) feet;  
S 68°-52'-49" E one hundred ninety-nine and ninety-seven hundredths (199.97) feet;  
S 71°-51'-43" E two hundred forty-four and thirty-one hundredths (244.31) feet;  
S 33°-46'-56" E two hundred seventy-six and forty-four hundredths (276.44) feet;  
S 12°-38'-32" E eighty-seven and seventy-nine hundredths (87.79) feet;  
S 10°-41'-32" W one hundred sixteen and fifty-one hundredths (116.51) feet;  
S 02°-07'-16" E sixty-four and eighty-nine hundredths (64.89) feet;  
S 37°-52'-30" W two hundred nineteen and seven hundredths (219.07) feet;  
S 04°-11'-06" E one hundred sixty-four and fifty-six hundredths (164.56) feet;  
S 02°-47'-07" W one hundred forty-eight and twenty-eight hundredths (148.28) feet;  
S 03°-07'-30" W one hundred ninety-five and thirty-one hundredths (195.31) feet;  
S 26°-01'-44" E one hundred seventy-one and twenty-one hundredths (171.21) feet;  
S 35°-37'-40" E two hundred three and fifty-seven hundredths (203.57) feet;  
S 40°-59'-09" E two hundred twenty-two and eighty-five hundredths (222.85) feet;  
S 18°-51'-11" E fifty-nine and seventy-four hundredths (59.74) feet;  
S 18°-55'-29" W fifty-one and two hundredths (51.02) feet;  
S 74°-03'-17" W eighty and thirty-one hundredths (80.31) feet;  
S 78°-50'-47" W one hundred twenty-eight and eighteen hundredths (128.18) feet;  
N 80°-21'-56" W eighty-two and twenty-four hundredths (82.24) feet;  
N 79°-36'-10" W one hundred fifty-two and eighty-one hundredths (152.81) feet;  
S 86°-12'-16" W one hundred thirty-three and ninety-three hundredths (133.93) feet;  
S 38°-09'-26" W one hundred seventy-two and three hundredths (172.03) feet;  
S 00°-00'-00" W two hundred forty-six and thirty-nine hundredths (246.39) feet;  
S 09°-15'-09" E two hundred fifteen and ten hundredths (215.10) feet;  
S 09°-15'-09" E sixty-six and eighty-seven hundredths (66.87) feet;  
S 02°-14'-04" W sixty-six and forty-four hundredths (66.44) feet;  
S 06°-34'-55" W thirty-six and nine hundredths (36.09) feet;  
S 32°-18'-23" W seventy and seventy-two hundredths (70.72) feet;  
S 41°-29'-47" W eighty-five and eighty-seven hundredths (85.87) feet;  
N 89°-23'-26" W one hundred sixteen and twenty-six hundredths (116.26) feet;  
N 70°-45'-02" W one hundred sixty-five and six hundredths (165.06) feet;  
N 68°-22'-09" W one hundred fifty-four and thirty-four hundredths (154.34) feet;  
N 54°-26'-42" W one hundred twenty-six and sixty-three hundredths (126.63) feet;  
N 19°-37'-53" W one hundred five and sixty-six hundredths (105.66) feet;  
N 11°-34'-49" E eighty and forty-four hundredths (80.44) feet;  
N 16°-56'-05" W one hundred six and thirty-nine hundredths (106.39) feet;  
N 85°-06'-03" W eighty-six and eighty-nine hundredths (86.89) feet;  
N 67°-22'-48" W ninety-six and forty-seven hundredths (96.47) feet;  
N 47°-54'-39" W one hundred three and thirty-three hundredths (103.33) feet;  
N 87°-05'-20" W ninety-four and twelve hundredths (94.12) feet;  
S 27°-05'-44" W one hundred nineteen and ninety-six hundredths (119.96) feet;  
S 17°-46'-17" E two hundred three and forty-two hundredths (203.42) feet;  
S 65°-25'-58" W ninety-five and fifty-eight hundredths (95.58) feet;



S 79°-19'-49" W one hundred seventy-four and thirty-eight hundredths (174.38) feet;  
S 53°-36'-56" W one hundred seventeen and twenty-three hundredths (117.23) feet;  
N 84°-48'-20" W one hundred nine and seventy-three hundredths (109.73) feet;  
S 78°-12'-57" W three hundred forty-four and seventeen hundredths (344.17) feet;  
N 77°-30'-12" W two hundred fifty-two and seventy-three hundredths (252.73) feet;  
S 78°-26'-24" W eighty-seven and seventy-two hundredths (87.72) feet;  
N 88°-47'-19" W two hundred fifteen and fifty-four hundredths (215.54) feet;  
N 79°-02'-45" W one hundred two and seventy-eight hundredths (102.78) feet;  
N 76°-11'-42" W one hundred seventeen and thirty-two hundredths (117.32) feet;  
S 36°-08'-21" W one hundred twenty-two and fifty-four hundredths (122.54) feet;  
S 17°-35'-12" E one hundred fifty-two and ninety-eight hundredths (152.98) feet;  
S 36°-13'-08" E fifty-seven and thirty hundredths (57.30) feet;  
S 66°-57'-23" E ninety-four and eighty hundredths (94.80) feet;  
S 86°-29'-47" E thirty-one and ninety-six hundredths (31.96) feet;  
S 50°-23'-43" E one hundred sixty-six and forty-seven hundredths (166.47) feet;  
N 83°-11'-55" E seventy-one and forty-seven hundredths (71.47) feet;  
S 65°-41'-44" E eighty-eight and fifty-eight hundredths (88.58) feet;  
S 70°-52'-29" E eighty-five and forty-five hundredths (85.45) feet;  
S 49°-21'-04" E eighty-four and ninety-five hundredths (84.95) feet;  
S 56°-34'-45" E one hundred fifty-three and sixty-six hundredths (153.66) feet;  
S 27°-40'-52" W forty-four and eighty-five hundredths (44.85) feet;  
S 54°-41'-20" E ninety-five and seventy-four hundredths (95.74) feet;  
S 26°-44'-14" E ninety-six and ninety-five hundredths (96.95) feet;  
S 23°-27'-58" E one hundred eighty-three and eleven hundredths (183.11) feet;  
S 58°-27'-55" E one hundred thirty-four and forty-four hundredths (134.44) feet;  
S 46°-28'-53" E two hundred thirteen and sixty-eight hundredths (213.68) feet;  
S 19°-11'-29" E one hundred twenty-four and seventy-seven hundredths (124.77) feet;  
S 06°-42'-35" E fifty-five and seventy-two hundredths (55.72) feet;  
S 08°-07'-48" E eighty-two and eighty-six hundredths (82.86) feet;  
S 26°-59'-45" E one hundred sixteen and seventeen hundredths (116.17) feet;  
S 29°-00'-55" E one hundred eighty-three and eighty-nine hundredths (183.89) feet;  
S 05°-49'-35" W thirty-two and seven hundredths (32.07) feet;  
S 17°-06'-10" E fifty-three and thirteen hundredths (53.13) feet;  
S 61°-05'-13" E one hundred twenty-seven and ninety-two hundredths (127.92) feet;  
S 80°-25'-33" E three hundred twenty-eight and eighty hundredths (328.80) feet;  
S 84°-07'-15" E two hundred eighty-six and one hundredths (286.01) feet;  
N 84°-24'-30" E ninety-three and fifty-four hundredths (93.54) feet;  
S 55°-57'-15" E fifty-eight and fourteen hundredths (58.14) feet;  
S 33°-31'-50" E one hundred twenty-nine and sixty-five hundredths (129.65) feet;  
S 34°-33'-45" E seventy-one and fifteen hundredths (71.15) feet;  
S 36°-43'-04" E one hundred forty-seven and one hundredths (147.01) feet;  
N 59°-08'-45" E fifty-eight and thirty-nine hundredths (58.39) feet;  
S 86°-37'-13" E one hundred sixty-five and sixty-five hundredths (165.65) feet;  
S 61°-00'-56" E one hundred three and forty-five hundredths (103.45) feet;  
S 49°-06'-36" E one hundred fifty-four and sixteen hundredths (154.16) feet;  
S 34°-29'-02" E seventy-eight and nineteen hundredths (78.19) feet;  
S 71°-38'-18" E one hundred sixty-one and twenty hundredths (161.20) feet;  
S 30°-04'-07" E one hundred fourteen and thirty-five hundredths (114.35) feet;



S 44°-16'-07" E one hundred eight and nineteen hundredths (108.19) feet;  
S 38°-14'-02" E one hundred nine and forty-one hundredths (109.41) feet;  
S 60°-23'-25" E one hundred thirty-seven and four hundredths (137.04) feet;  
S 62°-49'-28" E one hundred sixty-three and ninety-three hundredths (163.93) feet;  
S 74°-03'-17" E one hundred four and twenty-seven hundredths (104.27) feet;  
S 45°-58'-16" E one hundred eight and sixty-six hundredths (108.66) feet;  
S 80°-19'-36" E one hundred sixteen and twenty-four hundredths (116.24) feet;  
N 77°-25'-01" E seventy-four and seventy-one hundredths (74.71) feet;  
N 88°-34'-04" E seventy-eight and fifteen hundredths (78.15) feet;  
N 80°-43'-39" E ninety-six and ninety-seven hundredths (96.97) feet;  
S 71°-52'-11" E seventy-seven and forty-one hundredths (77.41) feet;  
S 58°-56'-13" E one hundred ninety-three and five hundredths (193.05) feet;  
S 71°-50'-34" E one hundred twenty-seven and forty-four hundredths (127.44) feet;  
S 64°-21'-57" E one hundred ninety-seven and fourteen hundredths (197.14) feet;  
S 77°-26'-18" E one hundred twenty-two and seventy-three hundredths (122.73) feet;  
S 30°-57'-50" E two hundred one and twenty hundredths (201.20) feet;  
S 50°-26'-00" E one hundred seventy-nine and eighty-nine hundredths (179.89) feet;  
S 63°-08'-17" E fifty-six and nineteen hundredths (56.19) feet;  
S 35°-47'-51" E two hundred fifty and forty-three hundredths (250.43) feet;  
S 15°-47'-51" E one hundred thirty-eight and seventy hundredths (138.70) feet;  
S 16°-33'-05" E one hundred sixty-nine and twelve hundredths (169.12) feet;  
S 10°-18'-17" E fifty-eight and twenty-three hundredths (58.23) feet;  
S 29°-18'-53" E two hundred thirty-six and sixty-nine hundredths (236.69) feet;  
S 09°-41'-20" E one hundred sixty-two and forty-seven hundredths (162.47) feet;  
S 04°-20'-24" W one hundred forty-six and twenty-five hundredths (146.25) feet;  
S 13°-31'-35" E two hundred eighty-three and ninety-two hundredths (283.92) feet;  
S 30°-40'-26" E one hundred fifty-four and forty-two hundredths (154.42) feet;  
S 06°-22'-25" E one hundred twenty-three and sixteen hundredths (123.16) feet;  
S 34°-48'-26" W two hundred thirty-one and fifty-three hundredths (231.53) feet;  
S 65°-27'-44" W sixty-five and eighty-four hundredths (65.84) feet;  
S 34°-44'-35" W forty-nine and twelve hundredths (49.12) feet;  
S 62°-31'-32" W seventy-three and thirty-eight hundredths (73.38) feet;  
S 54°-34'-37" W one hundred thirteen and forty-five hundredths (113.45) feet;  
S 17°-06'-47" W two hundred sixty-seven and seventy-one hundredths (267.71) feet;  
S 29°-16'-05" W sixty-seven and ninety-one hundredths (67.91) feet;  
S 13°-42'-25" W one hundred thirty-seven and thirty-eight hundredths (137.38) feet;  
S 08°-29'-20" W forty-four and ten hundredths (44.10) feet;  
S 39°-37'-24" W seventy-eight and sixty-one hundredths (78.61) feet;  
S 44°-29'-02" W one hundred two and twenty hundredths (102.20) feet;  
S 37°-08'-19" E one hundred eleven and seven hundredths (111.07) feet;  
S 49°-49'-37" E one hundred three and ninety-five hundredths (103.95) feet;  
S 55°-20'-41" E one hundred seventeen and ninety-three hundredths (117.93) feet;  
S 24°-19'-56" E two hundred seventy-six and fifty-two hundredths (276.52) feet;  
S 24°-42'-47" E one hundred twenty-six and fourteen hundredths (126.14) feet;  
S 06°-41'-43" W one hundred fifty and seventy-seven hundredths (150.77) feet;  
S 04°-01'-10" W two hundred forty-one and forty-eight hundredths (241.48) feet;  
S 23°-31'-13" W one hundred thirty-seven and four hundredths (137.04) feet;  
S 20°-04'-55" W sixty-four and forty-seven hundredths (64.47) feet;



S 05°-11'-40" W thirty-five and ninety-five hundredths (35.95) feet;  
S 00°-32'-26" E sixty-nine and one hundredths (69.01) feet;  
S 19°-14'-58" E forty-three and forty-four hundredths (43.44) feet;  
S 10°-18'-17" E twenty-nine and twelve hundredths (29.12) feet;  
S 11°-44'-19" W fifty-one and twenty hundredths (51.20) feet;  
S 10°-11'-29" E fifty-eight and eighty-seven hundredths (58.87) feet;  
S 05°-11'-40" W twenty-one and fifty-seven hundredths (21.57) feet;  
S 31°-13'-06" W twenty-five and twelve hundredths (25.12) feet;  
S 34°-45'-04" W one hundred twenty-six and seventy-eight hundredths (126.78) feet;  
S 31°-41'-27" W eighty-seven and ninety-nine hundredths (87.99) feet;  
S 11°-27'-32" E ninety-eight and thirty-one hundredths (98.31) feet;  
S 13°-51'-40" E fifty-one and sixty-three hundredths (51.63) feet;  
S 24°-58'-26" E fifty-two and forty-three hundredths (52.43) feet;  
S 27°-37'-03" E one hundred ten and ninety-five hundredths (110.95) feet;  
S 16°-10'-43" E two hundred nineteen and sixty-four hundredths (219.64) feet;  
S 28°-05'-41" E one hundred nine and eight hundredths (109.08) feet;  
S 39°-59'-13" E twenty-one and seven hundredths (21.07) feet;  
S 06°-18'-03" E two hundred fifty-one and fifty-two hundredths (251.52) feet;  
S 37°-45'-07" E one hundred forty-eight and eighty-seven hundredths (148.87) feet;  
S 21°-33'-00" W two hundred seventy-eight and thirty-four hundredths (278.34) feet;  
S 53°-03'-16" W twenty-three and forty-two hundredths (23.42) feet;  
S 88°-26'-24" W one hundred ninety-one and forty hundredths (191.40) feet;  
S 56°-18'-36" W ninety-five and fifty-eight hundredths (95.58) feet;  
S 85°-41'-02" W two hundred one and twenty-nine hundredths (201.29) feet;  
S 24°-22'-35" W eighty-eight and seventy hundredths (88.70) feet;  
S 10°-53'-08" W sixty-six and eighty-five hundredths (66.85) feet;  
S 05°-16'-47" E seventy-seven and four hundredths (77.04) feet;  
S 62°-51'-54" W thirty-two and twenty-five hundredths (32.25) feet;  
S 71°-33'-54" W forty-four and twenty-four hundredths (44.24) feet;  
S 46°-43'-12" W sixty-three and fifty-three hundredths (63.53) feet;  
S 12°-31'-44" E fifty-eight and nineteen hundredths (58.19) feet;  
S 50°-25'-48" E two hundred thirty-five and eighty-two hundredths (235.82) feet;  
S 68°-39'-15" E one hundred seventeen and ninety-one hundredths (117.91) feet to an unmonumented point (having a north coordinate of N 16,411,750 and an east coordinate of E 1,341,312 Datum UTM Zone 19 FEET NAD 83).

**EXHIBIT B-3**

## CMP - Preserve

A certain lot or parcel of land being a lease area twelve (12) feet in width situated westerly of, but not abutting, Long Falls Dam Road in Dead River Twp (T3 R3 BKP WKR), Somerset County, Maine, the centerline of said lease is as follows:

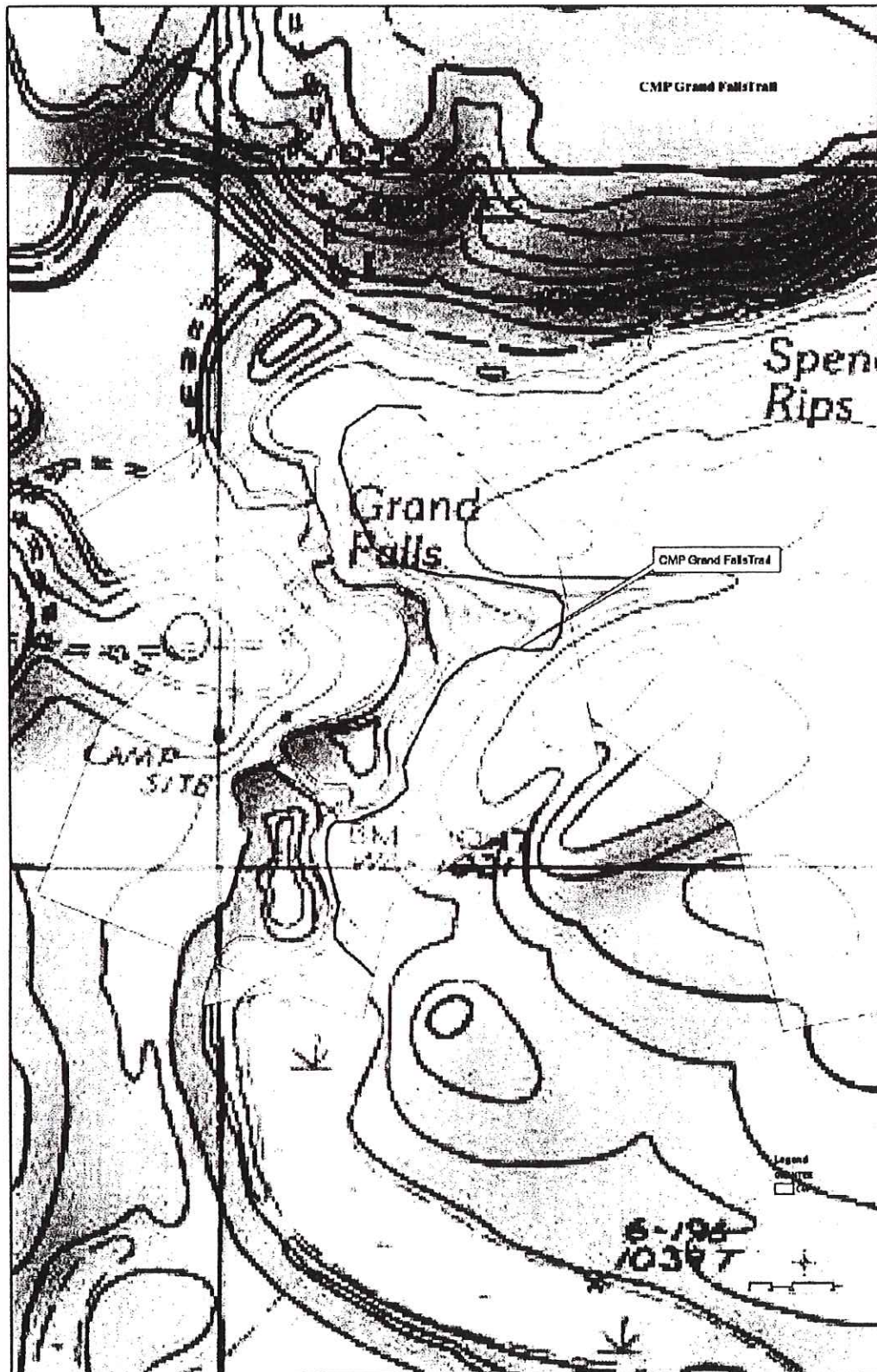
Beginning at an unmonumented point (having a north coordinate of N 16,411,750 and an east coordinate of E 1,341,312 Datum UTM Zone 19 FEET NAD83);

Thence, westerly as the course may be along the centerline of an existing trail on the following courses and distances:

S 64°-05'-09" W one hundred fifty and sixteen hundredths (150.16) feet;  
S 81°-15'-14" W two hundred eighty-five and eighty-six hundredths (285.86) feet;  
S 82°-52'-30" W three hundred fifty and forty-five hundredths (350.45) feet;  
S 89°-01'-44" W four hundred twenty-seven and forty-nine hundredths (427.49) feet;  
N 89°-15'-39" W one thousand one hundred twenty-three and zero hundredths (1123.00) feet;  
N 89°-15'-56" W five hundred sixty-five and twelve hundredths (565.12) feet;  
S 87°-06'-31" W seven hundred eighteen and thirteen hundredths (718.13) feet;  
S 78°-03'-21" W three hundred eighty-five and five hundredths (385.05) feet to an unmonumented point (having a north coordinate of N 16,411,496 and an east coordinate of E 1,337,338 Datum UTM Zone 19 FEET NAD83)



EXHIBIT C



**EXHIBIT C-1****CMP Grand Falls**

A certain lot or parcel of land being a lease area twelve (12) feet in width situated easterly of, but not abutting, Dead River in Spring Lake Township (T3 R4 BKP WKR), the centerline said lease area being as follows:

Beginning at an unmonumented point (having a north coordinate of N 16,459,534 and an east coordinate of E 1,326,569 Datum UTM Zone 19 FEET NAD83) located on the easterly line of land of Central Maine Power Company (Grand Falls Parcel);

Thence, southerly and easterly as the course may be along the centerline of an existing trail through land of Central Maine Power Company on the following courses and distances:

N 87°-47'-51" W two hundred eleven and fifty hundredths (211.50) feet;  
 S 55°-37'-11" W one hundred eighty-seven and fourteen hundredths (187.14) feet;  
 S 13°-14'-26" W one hundred forty-one and ninety-six hundredths (141.96) feet;  
 S 17°-44'-41" E two hundred thirteen and thirty-seven hundredths (213.37) feet;  
 S 23°-57'-45" E two hundred forty and eighteen hundredths (240.18) feet;  
 S 57°-59'-41" E one hundred fifty-three and thirty-seven hundredths (153.37) feet;  
 S 75°-57'-50" E two hundred one and nine hundredths (201.09) feet;  
 S 85°-25'-34" E two hundred three and eighty-seven hundredths (203.87) feet;  
 S 79°-12'-57" E three hundred forty-seven and fifty-four hundredths (347.54) feet;  
 S 40°-36'-05" E seventy-four and ninety-four hundredths (74.94) feet;  
 S 07°-07'-30" W one hundred thirty-one and seven hundredths (131.07) feet;  
 S 26°-33'-54" W ninety and eighty-eight hundredths (90.88) feet;  
 S 85°-54'-52" W one hundred fourteen and nine hundredths (114.09) feet;  
 N 82°-52'-30" W one hundred thirty-one and seven hundredths (131.07) feet;  
 S 68°-11'-55" W one hundred seventy-five and ten hundredths (175.10) feet;  
 S 46°-10'-29" W one hundred sixty-four and seventy-seven hundredths (164.77) feet;  
 S 27°-57'-03" W three hundred thirty-nine and thirty-seven hundredths (339.37) feet;  
 S 23°-07'-53" W eighty-five and sixty-six hundredths (85.66) feet;  
 S 12°-26'-22" E one hundred six and fifty-one hundredths (106.51) feet;  
 S 47°-29'-22" W one hundred twenty-four and forty-nine hundredths (124.49) feet;  
 S 67°-17'-40" W sixty-three and zero hundredths (63.00) feet;  
 S 66°-36'-53" W one hundred twenty-three and thirty-one hundredths (123.31) feet;  
 S 89°-00'-44" W eighty-eight and seventy-two hundredths (88.72) feet;  
 S 43°-36'-10" W forty-four and thirty-six hundredths (44.36) feet;  
 S 10°-50'-25" W seventy-three and nineteen hundredths (73.19) feet;  
 S 03°-10'-47" E eighty-two and seventy-two hundredths (82.72) feet;  
 S 15°-41'-24" E one hundred forty-one and thirty-nine hundredths (141.39) feet;  
 S 11°-46'-06" E seventy-four and ninety-nine hundredths (74.99) feet;  
 S 12°-14'-20" W seventy-two and fifteen hundredths (72.15) feet;  
 S 00°-00'-00" E eighty-two and fifty-nine hundredths (82.59) feet;  
 S 38°-30'-02" E eighty-five and ninety-nine hundredths (85.99) feet;  
 S 50°-26'-25" E ninety-one and twenty-six hundredths (91.26) feet;



S 44°-18'-35" E eighty-nine and seventy-seven hundredths (89.77) feet to an unmonumented point (having a north coordinate of N 16,456,845 and an east coordinate of E 1,326,333 Datum UTM Zone 19 FEET NAD83) located on the easterly line of land of Central Maine Power Company.

This topographic map depicts the Hurricane Area, featuring a grid system and contour lines. The map is labeled with 'Hurricane Area' in the bottom left and 'CMP Enchanted Trail' in the top right. Four specific trails are highlighted and labeled: 'Enchanted Trail 1', 'Enchanted Trail 2', 'Enchanted Trail 3', and 'Enchanted Trail 4'. A scale bar is located in the bottom right corner, indicating distances in miles and kilometers. The map also shows various elevation points and contour lines, providing a detailed view of the terrain.

**EXHIBIT D-1**

Four certain lots or parcels of land being lease areas twelve (12) feet in width situated westerly of, but not abutting, U.S. Route 201 and northerly of, but not abutting, Dead River in Lower Enchanted Township, Somerset County, Maine, the centerline of each lease area being further described as follows:

**CMP Enchanted 1**

Beginning at an unmonumented point (having a north coordinate of N 16,472,156 and an east coordinate of E 1,360,669 Datum UTM Zone 19 FEET NAD83) located on the northerly line of land of Central Maine Power Company (reference a deed dated May 1, 1923 and recorded in the Somerset County Registry of Deeds in Book 373 Page 250);

Thence, southerly and westerly along the centerline of an existing trail on the following courses and distances:

S 55°-00'-29" W three hundred seventy-four and thirty-five hundredths (374.35) feet;  
S 41°-23'-30" W four hundred eighty-two and thirty-seven hundredths (482.37) feet;  
S 77°-20'-51" W three hundred eight and two hundredths (308.02) feet;  
S 84°-35'-17" W five hundred eighty-five and thirty hundredths (585.30) feet;  
S 67°-14'-56" W two hundred six and eighteen hundredths (206.18) feet;  
N 90°-00'-00" W two hundred twenty and eighty-one hundredths (220.81) feet to an unmonumented point (having a north coordinate of N 16,471,377 and an east coordinate of E 1,358,749 Datum UTM Zone 19 FEET NAD83) located on the northerly line of land of Central Maine Power Company.

**CMP Enchanted 2**

Beginning at an unmonumented point (having a north coordinate of N 16,471,635 and an east coordinate of E 1,358,031 Datum UTM Zone 19 FEET NAD83) located on the easterly line of land of Central Maine Power Company;

Thence, westerly and southwesterly along the centerline of an existing trail on the following courses and distances:

N 86°-49'-13" W one hundred ten and fifty-seven hundredths (110.57) feet;  
S 54°-51'-57" W two hundred two and fifty hundredths (202.50) feet;  
S 66°-22'-14" W four hundred twenty-eight and forty-seven hundredths (428.47) feet;  
S 59°-44'-37" W one hundred seventy and forty-two hundredths (170.42) feet;  
N 56°-49'-17" W one hundred ninety and fifty-four hundredths (190.54) feet to an unmonumented point (having a north coordinate of N 16,471,371 and an east coordinate of E 1,357,056 Datum UTM Zone 19 FEET NAD83) located at or near the northerly line of land of Central Maine Power Company.

**CMP Enchanted 3**

Beginning at an unmonumented point (having a north coordinate of N 16,471,898 and an east coordinate of E 1,355,951 Datum UTM Zone 19 FEET NAD83) located on the northeasterly line of land of Central Maine Power Company being northeasterly of Enchanted Stream;



Thence, northwesterly and southwesterly crossing Enchanted Stream at one point on the following courses and distances:

N 79°-19'-49" W eighty-six and fifty hundredths (86.50) feet;  
N 90°-00'-00" W one hundred ninety-nine and fifty-seven hundredths (199.57) feet;  
N 73°-44'-23" W three hundred sixty-nine and fifty-seven hundredths (369.57) feet;  
N 61°-35'-41" W two hundred seventy-four and fifty hundredths (274.50) feet;  
S 65°-08'-11" W fifty-five and sixty-seven hundredths (55.67) feet;  
S 27°-17'-03" E one hundred thirty-one and sixty-eight hundredths (131.68) feet;  
S 47°-53'-19" E three hundred eighty and twenty-seven hundredths (380.27) feet;  
S 50°-13'-59" E two hundred thirty-three and ninety-nine hundredths (233.99) feet;  
S 42°-53'-38" E five hundred one and fifty-eight hundredths (501.58) feet;  
S 37°-17'-17" E four hundred twelve and five hundredths (412.05) feet;  
S 36°-09'-29" E ninety-six and eighty-five hundredths (96.85) feet;  
S 14°-22'-53" E one hundred twenty-one and nine hundredths (121.09) feet;  
S 30°-31'-47" W one hundred thirty-six and seventeen hundredths (136.17) feet;  
S 42°-52'-44" W fifty-seven and forty-six hundredths (57.46) feet to an unmonumented point (having a north coordinate of N 16,470,553 and an east coordinate of E 1,356,112 Datum UTM Zone 19 FEET NAD83) located at or near the northeasterly line of land of Central Maine Power Company.

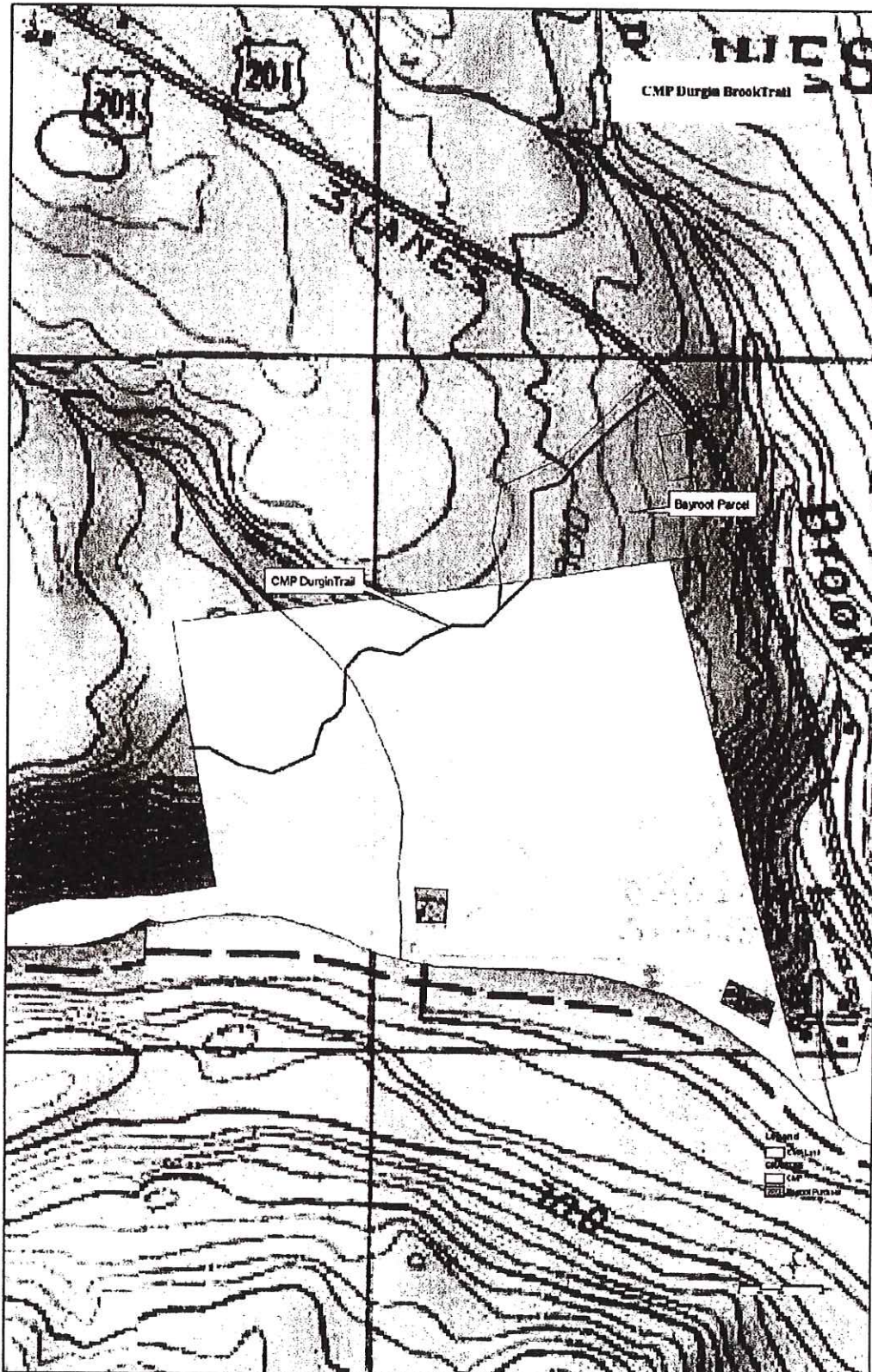
CMP Enchanted 4

Beginning at an unmonumented point (having a north coordinate of N 16,471,248 and an east coordinate of E 1,351,442 Datum UTM Zone 19 FEET NAD83) located at the easterly line of land of Central Maine Power Company;

thence, westerly through land of Central Maine Power Company on the following course and distance:  
N 73°-32'-53" W two hundred thirty-six and sixty-two hundredths (236.62) feet to an unmonumented point (having a north coordinate of N 16,471,315 and an east coordinate of E 1,351,215 Datum UTM Zone 19 FEET NAD83) located on the easterly line of land conveyed to Western Mountains Foundation by a deed from Penobscot Forest LLC dated December 28, 2005 and recorded in the Somerset County Registry of Deeds in Book 3651 Page 074.



EXHIBIT E





**EXHIBIT E-1**

CMP Durgin

A certain lot or parcel of land being a lease area twelve (12) feet in width situated westerly of, but not abutting, U.S. Route 201 in West Forks Plantation, Somerset County, Maine, the centerline of said lease area is as follows:

Beginning at or near the southerly boundary line of land conveyed to Bayroot, LLC by a deed dated November 21, 2003 and recorded in the Somerset County Registry of Deeds in Book 3237 Page 181 (having a north coordinate of N 16,479,411 and an east coordinate of E 1,385,357 Datum UTM Zone 19 FEET NAD83);

Thence, southerly, southwesterly and westerly or as the course may be, along the centerline of an existing trail on the following courses and distances:

S 05°-30'-16" W one hundred twenty-five and ten hundredths (125.10) feet;  
S 44°-17'-58" W one hundred two and forty-seven hundredths (102.47) feet;  
N 89°-03'-34" W one hundred forty-five and eighteen hundredths (145.18) feet;  
S 65°-13'-36" W one hundred fifty-six and ninety-four hundredths (156.94) feet;  
S 54°-18'-14" W one hundred twenty-nine and eighty-eight hundredths (129.88) feet;  
N 78°-54'-29" W one hundred fifty-seven and fifty hundredths (157.50) feet;  
S 65°-14'-17" W forty-eight and nineteen hundredths (48.19) feet;  
S 41°-42'-09" W ninety-nine and sixty-one hundredths (99.61) feet;  
S 03°-08'-33" W one hundred seventy-four and sixty-six hundredths (174.66) feet;  
S 36°-41'-09" W seventy-two and five hundredths (72.05) feet;  
S 62°-21'-06" W sixty-four and sixty-six hundredths (64.66) feet;  
S 20°-45'-21" W sixty-two and seventy-three hundredths (62.73) feet;  
S 15°-20'-12" W ninety and seventy-two hundredths (90.72) feet;  
S 65°-44'-42" W two hundred eighteen and fourteen hundredths (218.14) feet;  
N 76°-19'-11" W one hundred sixty-nine and twenty-four hundredths (169.24) feet;  
N 60°-58'-30" W one hundred fifty-nine and forty-two hundredths (159.42) feet;  
S 87°-42'-29" W ninety-five and seventy-four hundredths (95.74) feet to an unmonumented point at or near the westerly line of land of Bayroot, LLC (having a north coordinate of N 16,478,518 and an east coordinate of E 1,383,748 Datum UTM Zone 19 FEET NAD83).

Received  
Recorded Register of Deeds  
Apr 24, 2008 01:42P  
Somerset County  
Diane M Godin

## TRAIL USE AGREEMENT

THIS TRAIL USE AGREEMENT is made this 1st day of April, 2011 between and among CENTRAL MAINE POWER COMPANY, a Maine corporation having its principal place of business at 83 Edison Drive, Augusta, ME 04336 ("CMP") and the STATE OF MAINE, ACTING THROUGH THE DEPARTMENT OF CONSERVATION, BUREAU OF PARKS AND LANDS, OFF-ROAD VEHICLE DIVISION with a mailing address of 22 State House Station, Augusta, ME 04333-0022 ("MDOC") and its delegate(s), as permittee(s) under Section Sixteen hereof, including all Licensees listed in Schedule B ("Co-Licensees") who shall have the duty to abide by all the obligations and responsibilities of this license pertaining to Licensee. (MDOC and Co-Licensees are collectively referred to herein collectively as "Licensee" unless otherwise expressly provided.) Schedule B to be attached hereto and made a part of this agreement may be amended from time to time by the parties hereto to add or delete Co-Licenses in accordance with the terms of this Trail Use Agreement. CMP hereby grants to Licensee a revocable right to use, for the purposes described below; the following described premises ("Premises") under the conditions set forth herein.

### Section One - Premises

The Premises shall consist of so much of CMP's lands and rights of way lying within six (6) feet on either side of the centerline of the public recreational trail, together with the necessary side slopes; drainage rights, culverts, bridges and bridge abutments (collectively the "Trail") as shown on Schedule A plans, which shall be provided to CMP by Licensee as set forth below. Provided further that whenever the term Premises is used herein with respect to Licensee's obligations hereunder, the Premises shall include so much of CMP's lands and rights of way as Licensee may from time to time use, traverse upon or otherwise impact in connection with its construction, maintenance and use of the Trail. The Trail location will be shown on the Plans using GPS "tracks" or comparable technology in the location agreed to by CMP and MDOC. Schedule A may be amended from time to time by the parties hereto to add or delete Trails in accordance with the terms of this Trail Use Agreement. CMP and MDOC agree that within twenty-four (24) months of the execution of this Trail Use Agreement, MDOC will provide Plans to CMP for trail locations currently licensed under existing agreements ("Existing Licenses"). Upon providing such Plans, an amended Schedule A, reflecting the new Plans, will be attached and made a part of this Trail Use Agreement and the pertinent Existing License shall become null and void.

Attached hereto as Schedule B is a listing, as of the date of this Trail Use Agreement, of those organizations currently maintaining portions of the Trail together with a designation indicating which portion(s) of the Trail the organization is maintaining. No less frequently than annually, MDOC shall provide CMP with an updated listing of organizations using and maintaining portions of the Trail pursuant to this Trail Use Agreement, and designating therein the portions of the Trail so used and maintained by each said organization. Submission of Schedule B, as from time to time updated by MDOC, shall constitute a further representation by MDOC that each organization listed on Schedule B has agreed to be bound by the terms of this Trail Use Agreement.

### Section Two – Term, Consideration

#### 2.1. Term.

The term of this Trail Use Agreement is for three (3) years commencing on the date of execution of this Trail Use Agreement unless sooner terminated as provided herein. Provided the Licensee is not then in default, as defined in Section Twelve, herein, CMP will automatically renew this Trail Use Agreement for


additional one year terms unless either party gives the other written notice of its intent to terminate this Trail Use Agreement at least thirty (30) days prior to the end of the then current term.

## 2.2. Consideration.

The mutual covenants contained herein will constitute the consideration for this Use Agreement. CMP shall not be paid a fee for the permission granted hereunder.

## Section Three - Specific Use

### 3.1. Permitted Uses.

 The purpose of this Trail Use Agreement is to provide revocable permission for limited public recreational access across the Premises, to the extent of CMP's fee ownership or permitted under CMP's rights of way and easements. Subject to any restrictions pertaining to any such fee ownership, right of way or easement of CMP, Licensee may only use the Premises for a 12-foot wide recreational access Trail for recreational use by pedestrians, bicycles, snowmobiles and/or All Terrain Vehicles ("ATV") in accordance with and subject to the terms, conditions and restrictions contained in this Trail Use Agreement. For the purpose of this Trail Use Agreement, an ATV is defined as a motorized, off-road, recreational vehicle having 3 or 4 wheels, being 60 inches or less in width. For the purpose of this Trail Use Agreement, a snowmobile is defined as a tracked motorized vehicle with two parallel skis located at the front of the vehicle. Said vehicle shall not exceed 60 inches in width. Certain ATVs modified with tracks may be registered as snowmobiles and are permitted if they meet the width restrictions. The Licensee will designate the specific Trail on plans to be submitted and approved by CMP, which plans shall be incorporated into or attached to Schedule A. The design of the Trail will not accommodate road-licensed vehicles, and Licensee shall post the Trail to specifically prohibit use of the Trail by dirt bikes, motorcycles and road-licensed vehicles. Additionally, Trails designated for snowmobile use only shall be posted for "No ATV" use. These use restrictions are not intended to preclude use by motorized vehicles engaged in construction, maintenance or repair of the Trail, as provided below. Licensee shall not be permitted to pave any of the Trails without the prior written consent of CMP, which consent may be withheld at CMP's discretion. Licensee has the right to temporarily halt or revoke the use of any or all Trails, or sections thereof, licensed under this Trail Use Agreement over the Premises, or any portion thereof if, in its sole discretion, it determines that conditions, including but not limited to weather, have caused or will cause environmental damage to the Premises or waters contained therein.

### 3.2. Camping Prohibited Without CMP Consent.

Licensee shall not use any portion of the Premises for camping or for any use other than specified in Section 3.1 without the prior written consent of CMP which consent may be withheld at CMP's discretion.

### 3.3 Improvements.

Licensee may install improvements such as culverts, small bridges, safety barriers and signs, provided that they do not interfere with CMP's operations, as determined solely by CMP and are in strict compliance with Section Four below. Licensee, or its agents, may use, as necessary, motorized vehicles for installation of Trail improvements and for Trail maintenance.



## Section Four – Licensee Obligations and Restrictions

### 4.1. Improper Activities.

Licensee shall not use the Premises in any manner that will endanger health, create a nuisance, or be incompatible with CMP's use of the Premises in its business as a public utility. Each Licensee shall use the Premises in a safe manner and comply with all applicable federal, state and local laws, including without limitation, any laws pertaining to the use and operation of recreational vehicles (e.g., 12 M.R.S.A. § 13001 et seq, 13101 et. seq., 13151 et. seq. and 13157-A. Licensee shall take reasonable measures to inform any person using the Trail about Licensee's obligations under this section and require such users to strictly adhere to the obligations hereunder.

### 4.2. Notification to Abutting Landowners.

Prior to the initiation of any Trail construction and the proposed use of any new portion of the Trail, Licensee or Co-Licensees will provide written notification of the proposed Trail to all abutting landowners of record along the affected Premises. Licensee shall investigate at its expense any landowner objections resulting from such notification(s), or any complaints arising from the ensuing use of the Trail. The resolution of such objections or complaints shall be determined to the reasonable satisfaction of CMP, Licensee and said landowner(s).

### 4.3. Trail Location.

Licensee shall obtain CMP's prior written approval to the location(s) of any additions and modifications to the trails authorized by this Agreement. To the extent practicable and in accordance with State of Maine laws, including but not limited to laws and regulations related to ATV and snowmobile operation, the Trail will be located along the outer edge of CMP's lands, unless otherwise approved in writing by CMP and subject to Section 6.3 below. Co-Licensee shall mark the proposed Trail with flagging prior to CMP inspecting the Trail location. Licensee or Co-Licensee may have a representative(s) accompany the CMP inspector on the site visit. CMP inspector will conduct a post-construction inspection when notified of completion of construction.

### 4.4. Trail Construction and Excavation Work.

Licensee shall perform any construction, maintenance and excavation work in compliance with (i) any and all applicable federal, state, and local laws, and (ii) any applicable CMP standards regarding work conducted within its rights of ways which standards shall be provided by CMP to Licensee in advance of any such work. At least ten (10) business days prior to commencement of any Trail construction, maintenance or excavation involving the use of heavy equipment on the Premises, Licensee will contact the line superintendent of CMP's Transmission Department at (207) 626-9562, or such other contact person as CMP may from time to time designate. Without limiting the generality of the foregoing, or the provisions of Section Five below, Licensee shall comply with the following standards, rules and restrictions:

4.4.1 All notification requirements under the Dig Safe Call Center at 1-888-DIG-SAFE and comply with the provisions of both the Maine Dig Safe Statute, M.R.S.A., Title 23, Section 3360-A as from time to time amended, and any rules and regulations pertaining thereto.

4.4.2 The Overhead High-Voltage Line Safety Act, M.R.S.A., Title 35A, Section 751, et seq., Chapter 7-A, as from time to time amended, and any rules and regulations pertaining thereto.

Art Brown  
Elec.  
Maint.  
Eng.

★ 4.4.3 Licensee will not allow any vehicle, equipment or machinery to come within an area in which any part of it, including but not limited to any arm, bucket, blade or knuckle, has the capability, even if improbable, of extending to within fifteen (15) feet of CMP's overhead wires on the Premises.

★ 4.4.4 Licensee shall permit no excavation or construction on the Premises unless all necessary permits or any necessary third-party consents and approvals have been obtained and Licensee has complied with the foregoing provisions. When excavation is required and approved, a CMP inspector may be required to be present during such excavation at the sole cost and expense of the Licensee or Co-Licensee. Excavation work that does require the presence of an inspector will be performed Monday through Friday from 7:00 AM to 5:00 PM.

4.4.5. No portion of the Trail may pass between poles on a multi-pole structure, or within 25 feet of any pole, guy wire or substation fence. In the event that any portion of the Trail is found to pass within 25 feet of a transmission pole, guy wire or substation fence, CMP may, subject to the provisions of paragraph 4.12.1 below, (i) require Licensee to remove or relocate the Trail, (ii) require Licensee to construct, between said pole, guy wires or fence and the Trail, barriers that are adequate to protect said poles and guy wires from damage, or (iii) relocate its transmission poles or guy wires in order to accommodate the provisions of this Trail Use Agreement, (iv) Trails constructed prior to the date of this Agreement that are at least 15 feet from structures, may not be required to meet the 25 foot restriction. Licensee shall not install any such barrier without first obtaining CMP's written approval of the design, composition and installation thereof, and the construction and maintenance of said barriers, as well as any relocation of transmission poles or guy wires, will be at the Licensee's sole cost and expense.

#### 4.5. Changes in Trail Plans.

At such time as Licensee shall obtain any written approval by CMP for a new Trail or a change in an existing Trail location and design, Licensee will provide CMP with a plan showing centerline location of the Trail, all improvements to be constructed by Licensee and the location of CMP's existing poles and guy anchors, if any, located within the Premises. As set forth above any new Trail plan will be attached and become part of Schedule A and shall become subject to the terms of this Trail Use Agreement.

#### 4.6. Vegetation Management.

Licensee may only cut vegetation and timber to the extent required to establish and maintain the Trail. Prior to the cutting, pruning or trimming of any trees of 10 feet or higher on the Premises, Licensee will notify appropriate CMP Vegetation Management personnel by calling (207) 621-3943 and subsequently comply with all requirements and conditions as set forth by said CMP representatives, as well as in accordance with all State and municipal laws and requirements. At no time will Licensee pile or burn any trimmed vegetation on the transmission corridor. All vegetative waste will be chipped on site or hauled away. Licensee shall use only CMP pre-approved contractors for the cutting or trimming of any trees of 10 feet or higher. CMP assumes no obligation or liability under this Trail Use Agreement to trim or cut trees in and around the Trails for purposes of establishing and maintaining the Trail. Nothing contained herein shall limit or compel CMP to perform at its discretion vegetation management. Any CMP Vegetation Management performed by CMP shall be for CMP's sole benefit.

#### 4.7. Signs and Postings.


Licensee may erect signage as needed to identify the Trail and its appropriate use in accordance with the guidelines and procedures adopted by the State of Maine, Department of Conservation, Bureau of Parks & Lands. No signs, Trail markers, reflectors, or notices of any kind will be attached to CMP structures.

Licensee will recognize CMP's grant of this Trail Use Agreement on any signs erected by the Licensee on the Premises and through any printed materials of Licensee that publicize the Trail. In the event CMP provides Licensee with recognition signs, and provided the signs are not otherwise contrary to any applicable law or regulation, Licensee will place them at trailheads and in other appropriate locations along the Trail. Upon written request, CMP shall have the right but not the obligation to review and approve all written materials and signage relative to CMP used by Licensee in connection with the Trail.

#### 4.8. Joint ATV/Snowmobile Trails.

Operation of ATVs on the Trail is prohibited when the Trail is groomed for snowmobile use and during the post-winter period of saturated soils (mud season). Licensee will determine when soils along the Trail are no longer saturated and ATV operation may resume at that time. Licensee shall not allow, and shall undertake reasonable measures to prevent, the use of any portion of the Trail by ATV's until such time as ATV usage will not impair the Premises or cause soil erosion or run off.

#### 4.9. Damage Repair.

 Licensee agrees to assume responsibility and all costs associated with any repairs resulting from damage to the Premises and CMP's facilities caused by Licensee's use of the Premises. Licensee agrees to stabilize the surface soils and flora in accordance with best management practices for trails, as reasonably as possible and consistent with CMP's use, to avoid further erosion of the soils or damage on or to the Premises.

#### 4.10. Waste.

Licensee will not make or suffer any waste of the Premises. Licensee will also take reasonable steps to keep the Premises free of litter and debris, including but not limited to cans, paper goods, tires, appliances, construction materials, etc., whether caused by Licensee or otherwise.

#### 4.11. Gate Installation.

Licensee agrees, upon reasonable request by CMP, to install and maintain gates or barricades across the Trail at public road crossings to prevent access to the Trail by road-licensed vehicles. Gate opening must be a minimum of 14 feet in width. All gates will include an interlocking key system. Such gates and their installation and maintenance will be at the sole cost of the Licensee. At the time of erecting any gate, Licensee shall provide CMP, and upon request any state or local emergency agency, access to the interlocking key system. **Maine Dig Safe Statutes as mentioned in paragraph 4.4.1 shall apply.**

#### 4.12. Notification and Right to Terminate Trail Use Agreement.

4.12.1. Prior to undertaking any activity on the Premises for which CMP will seek reimbursement from Licensee, CMP shall provide Licensee with reasonable written notice of the intended activity and the associated costs. CMP and Licensee agree to work in good faith to limit any and all costs arising out of this Trail Use Agreement, and when alternative activities are available, Licensee shall have the discretion to choose the least expensive alternative.

4.12.2. MDOC shall notify CMP in the event that MDOC loses authority to administer the Off Road Vehicle Division or its funding for such program, at which time, MDOC and CMP shall each have the right to terminate this Trail Use Agreement immediately upon giving written notice to the other party of termination. Nothing herein shall be construed to limit CMP's right to revoke the license granted under this Trail Use Agreement for any other reason. Nothing in this Agreement shall obligate MDOC or the State to fund any obligation for which there are no appropriated funds.

## Section Five – Permits & Requirements of Law

### 5.1. Permits and Approvals.

Upon execution of this Trail Use Agreement, Licensee will promptly seek and make reasonable effort to obtain all necessary federal, state and municipal approvals, licenses and permits. Licensee will not undertake any construction, improvements or installations until Licensee and CMP (if necessary) have procured all necessary permits or governmental approvals. Licensee will also assure that its use of the Trail is in compliance with all applicable laws and regulations, including, but not limited to, Department of Environmental Protection wetland regulations. Payment of any fines assessed by any agency for failure of Licensee to comply with any regulation or obtain necessary approvals, licenses and permits under this Trail Use Agreement will be the sole responsibility of the Licensee. Licensee and CMP will comply with all governmental laws, orders, ordinances and regulations and with any lawful order of any public officer or officials.

In the event that CMP approves of the construction or use of a new Trail, but Licensee or CMP, as the case may be, has not received the necessary permits or approvals within one (1) year after such approval, and the parties have not previously agreed to an extension of this time frame, said approval will be null and void.

### 5.2. CMP Rights of Way – Limitation/Need for Third-Party Permission.

To the extent it is determined that any portion of the Premises is subject to any use restrictions which would prohibit Licensee's use of the Premises or any Trail located within the Premises, in the manner contemplated hereunder, CMP shall have the right to restrict Licensee's use thereof, and Licensee shall either promptly relocate or discontinue the Trail, or obtain any necessary third-party consents or releases.

### 5.3. Abutting Property.

Licensee acknowledges and agrees that in any place that the Trail leaves the Premises and enters other private property, landowner permission has been or will have been acquired by Licensee or Co-Licensee in compliance with all laws and the provisions of this Trail License Agreement.

## Section Six - Rights and obligations of CMP

### 6.1. CMP Rights of Way Limitations.

Licensee's rights under this Trail Use Agreement are subject to any rights CMP has, prior to execution of this Trail Use Agreement or at any time during the term or any renewal term hereof, granted to third parties, even if such rights interfere with Licensee's use of the Premises. CMP also reserves the right to grant rights to third parties for use of all or part of the Premises, even if such rights interfere with Licensee's use of the Premises. The foregoing notwithstanding, CMP agrees to take reasonable efforts to not interfere and to prevent such third parties' interference with Licensee's use of the Premises to the extent permitted under any such third-party license. Neither CMP nor CMP's assignees will be liable to Licensee for any lawful interference with Licensee's use of the Premises. Licensee acknowledges and agrees that CMP shall have the right to terminate in whole or in part the license granted hereunder in the event that Licensee's use of the Premises interferes with the use of the Premises by CMP or any such third-party.



## 6.2. Trail Closure/Relocation.

CMP may close the Trail, or portions thereof, on a temporary basis to maintain, repair, replace, or rebuild its utility facilities. CMP will make a reasonable effort to provide a new location for any section of Trail, or portions thereof, that has been closed to facilitate the construction of new electrical transmission or distribution lines. Any work associated with relocating the Trail shall be at Licensee's cost.

## 6.3. CMP Use of Premises.

This Trail Use Agreement does not in any way affect the right of CMP or its representatives to enter upon the Premises at any and all times for any need arising out of its utility, land management or other business purpose, or for purposes permitted under any third-party license agreement. This right includes the right for CMP, its employees, agents or assignees to operate ATVs on snow-covered Trails groomed for snowmobile use. CMP has the right to use and enjoy fully in accordance with their capacity any improvements whatsoever that are, or may be, placed on the Premises by the Licensee. CMP reserves the right to specify the size and load-bearing capacity of any bridges installed by Licensee so that those bridges may accommodate CMP maintenance vehicles, provided, however Licensee shall not be responsible for any costs associated with accommodating CMP maintenance vehicles including without limitation construction or maintenance costs.

## 6.4. Right to Halt or Revoke Trail Use Agreement.

CMP has the right, but not the obligation, to temporarily halt or revoke the use of any or all Trails, or sections thereof, licensed under this Trail Use Agreement over the Premises, or any portion thereof if, in its sole discretion, it determines that conditions, including but not limited to weather, have caused or will cause excessive environmental damage to the Premises or waters contained therein.

# Section Seven - Waste & Environmental

## 7.1 Avoidance of Waste and Environmental Impact.

Licensee will take all reasonable precautions to ensure that construction, operation and maintenance of the Trails and all associated uses will occur in a manner that will protect the scenic, recreational, and environmental values of the Premises.

## 7.2 Hazardous Conditions.

CMP and its authorized representatives have the right to enter upon the Premises for any purpose and to inspect the Premises and to close any Trail, or portions thereof, without prior notice, if it is believed, in the sole opinion of CMP, that a hazardous or dangerous condition exists and/or there may be immediate and serious danger to the public. In such instances, CMP will immediately notify Licensee of the closure and the nature and cause of the closure. CMP assumes no obligation hereunder to conduct any such inspection or make any such closure. CMP shall not be liable to Licensee, any person claiming through Licensee or any person permitted by Licensee to use the Premises, for CMP's closure or failure to close the Trails.

# Section Eight - Operation and Maintenance by Licensee

## 8.1 Repairs and Maintenance of Trail/Compliance with Rules.

Licensee will perform or arrange for the performance of routine and major maintenance and repair of all improvements related to the construction and use of the Trail located on the Premises, including without

limitation gates, so that they remain orderly and safe. Licensee will also maintain the Trail in a safe condition, for example grading, bridge and culvert construction, maintenance of vegetation affecting the Trail and maintenance of all approved signs. Licensee will take reasonable measures to inform the public of the uses of the Premises permitted under this Trail Use Agreement. Licensee will also make reasonable efforts to enforce compliance with such uses and prevent harm or damage to the Premises, including but not limited to dumping.

## 8.2 Inspections.

CMP and its authorized representatives may periodically inspect the Premises to determine if maintenance may be necessary and will notify Licensee within a reasonable time period after discovery by CMP of any necessary maintenance to be performed by Licensee.

In the event that Licensee fails to perform its obligations under this Section within a reasonable period of time, CMP may, fourteen (14) days after mailing written notice to Licensee, terminate this Trail Use Agreement, or the use of specific Trails or sections thereof licensed under this Trail Use Agreement.

## **Section Nine - Surrender of Premises**

Upon revocation, expiration of the term or other termination of this Trail Use Agreement or the use of specific Trails or sections thereof licensed under this Trail Use Agreement, whether by reason of lapse of time or Licensee's default or otherwise, Licensee will quit and surrender the affected Premises, together with all improvements thereon, to CMP in as good order and condition as the Premises currently exists or may be improved except for ordinary wear and tear.

## **Section Ten - Insurance and Liability**

### 10.1 Recreational Use Only/Licensor Limitation of Liability.

Licensee agrees to conduct activities on said lands in a prudent manner and to take every reasonable precaution to prevent accidents of any nature. As aforesaid, the parties intend that any use permitted under this Trail Use Agreement shall be for recreational use only and therefore liability for injuries and/or damages suffered on the Trails is limited by Title 14, MRSA Chapter 7, Section 159-A of the revised Maine Statutes "Limited Liability for Recreational or Harvesting Activities", or in the case of the State the limitations of the "Maine Tort Claims Act" and other applicable laws.

### 10.2 Insurance Obligations.

Notwithstanding the foregoing, the parties agree as follows:

(i) The MDOC shall maintain liability insurance under its standard "Self-Insurance Fund" policy, which identifies CMP as an additional insured but does not expand or abrogate any applicable limitations of the Maine Tort Claims Act and/or Title 14 M.R.S.A. Section 159-A beyond provided insurance. Said insurance shall have a limit of liability of not less than \$500,000 per occurrence.

(ii) As a precondition to the undertaking of any major construction and excavation activity under Section 4.4 hereof, the MDOC and CMP may require that the contractor and, to the extent practical, the Co-Licensee, obtain insurance coverage upon terms and in such amounts as are customarily obtained for such construction work. Said insurance coverage shall identify the MDOC and CMP as additional insureds.

(iii) If a Co-Licensee maintains liability insurance with respect to its use of the trails, Co-Licensee shall, upon reasonable request, arrange for such policy to identify the MDOC and CMP as additional insureds.

(iv) Upon request by the MDOC or CMP, each Co-Licensee, will provide a certificate of insurance or other evidence of insurance demonstrating that the aforementioned insurance is in full force and effect.

The parties intend that solely with respect to the MDOC, any third party liability claim shall be addressed by, but only to the extent of, the insurance coverage purchased or required to be purchased pursuant to this Section. CMP disclaims all liability for any claims, suits, damages, or causes of action for damages resulting from any injury to person or property or loss of life sustained on the Premises.

### 10.3 MDOC Limitation of Liability.

Notwithstanding anything in this Agreement to the contrary, to the extent not covered under any insurance policy, as required hereunder or otherwise, the obligations of MDOC with respect to (i) any claim, suit, damage, or cause of action for damages resulting from injury to person or property, and (ii) obligations of MDOC shall be limited to available funding within the MDOC Off Road Vehicle Division, and such other funding or appropriation applicable to the MDOC's administration of this Trail Use Agreement. In no event shall the MDOC be liable hereunder in violation of any applicable laws or beyond appropriated funding for this purpose.

## Section Eleven – Release / Indemnification

### 11.1. Condition of Premises/Ownership.

CMP has made no representations of any nature in connection with the title to or condition of the Premises and Licensee accepts the Premises "as is". Without limiting the foregoing, CMP does not warrant or represent that it has sufficient interest in all or any part of the Premises for Licensee to exercise the rights described herein. CMP will not be liable for any latent or patent defects therein.

### 11.2. Release and Indemnity.

Neither CMP nor its parent company or their affiliates, nor its and their directors, officers, employees, agents, contractors, successors and assigns will be liable for, and Licensee hereby releases and, except as to the state of Maine indemnifies them, to the extent permitted by law and the policy limits noted above in Section 10 of this agreement, from and against, all claims of any kind or nature, including but not limited to claims for loss of life, personal injury or damage to property sustained by Licensee or any person claiming through Licensee resulting from any accident, occurrence or condition in or upon the Premises or related to this Trail Use Agreement, except for damage caused solely by the willful acts of CMP.

Licensee acknowledges that notwithstanding any action undertaken by CMP in connection herewith, including without limitation any review, suggestions for changes in design or approvals regarding the Trail, coordination of work, or provision of assistance in connection with the design, construction or maintenance of the Trail, neither CMP nor any of its officers or employees, assumes any responsibility or other obligation to the Licensee or its assignees, including those permitted to use the Trail by or through Licensee, concerning the design and location of the Trail, quality of the Trail construction or maintenance, or the Licensee's compliance with local, state or federal laws, codes, zoning requirements, handicap accessibility requirements or any other applicable laws and regulations as a result of or in connection with or applicable to the Trail and the uses permitted under this Trail Use Agreement. Licensee acknowledges that any actions by CMP in connection with the design, location, construction or

maintenance of the Trail are solely for its intended benefit and relate to its operation of the transmission line. Licensee assumes all obligations and responsibility to design, build, maintain, oversee and administer the use of the Trail in compliance with federal, state and local, environmental laws, codes, zoning requirements, handicap accessibility requirements and any other applicable laws and regulations and assumes responsibility for the quality of construction and maintenance thereof. Moreover, Licensee hereby waives any and all rights, claims or other actions against CMP. Co-Licensee, not including the state of Maine, agrees to indemnify, defend and hold CMP harmless against any and all claims, demands, actions, law suits, costs and expenses (including reasonable attorneys' fees) arising out of or in connection with the Trail. Notwithstanding the foregoing, the obligations of the state of Maine MDOC under this Section 11.2 shall be subject to and limited by Section 10 hereof.

The provisions of this Section will survive cancellation or termination of this Trail Use Agreement

### Section Twelve - Default

Licensee shall be in default ("Default") under this Trail Use Agreement if it breaches or fails to fully comply with any term or condition of this Trail Use Agreement within thirty (30) days (the "Cure Period") after receipt of written notice from CMP of any such failure to correct the conditions specified in the notice; provided that CMP may consent in writing to a longer Cure Period, with such consent not to be unreasonably withheld, if such condition cannot reasonably be cured within thirty (30) days, and Licensee has (i) promptly commenced within the Cure Period and diligently pursues curing the Default, and (ii) has undertaken corrective measures, including any measures set forth in Section 4.9, to protect the public health or safety, abate a nuisance, or prevent damage to the Premises.

In the event a Default occurs, CMP shall at its option, subject to the limitations contained in this Trail Use Agreement, have one or more of the following remedies, without notice or demand:

- a. termination of this Trail Use Agreement and immediate revocation of the permission granted hereunder;
- b. any remedies specifically provided in this Trail Use Agreement; and
- c. any remedies available in law or in equity, provided that any such remedy shall in the case of the MDOC be subject to the limitations set forth in Section 10.3 hereof.

### Section Thirteen - Notices

Any notice under this Trail Use Agreement will be in writing and will be deemed to be delivered when mailed by registered or certified mail, postage prepaid, addressed to the address of such party set forth below.

#### LICENSEE

Maine Department of Conservation  
Bureau of Parks & Lands—Off-Roads Vehicle Division  
22 State House Station  
Augusta, Maine 04333

#### CMP

Central Maine Power Company  
Real Estate Services  
83 Edison Drive  
Augusta, ME 04336

Either party may change its above address by giving notice of the change to the other party of such change of address to become effective for all purposes hereunder three (3) days after such notice is given.



#### Section Fourteen - Contact Person

In order to facilitate communication between CMP and Licensee, each party will designate a contact person for communications necessary under this Trail Use Agreement other than formal notices, which notices will be sent in accordance with the written notice provisions of this Trail Use Agreement.

#### Section Fifteen - No Waiver

Failure of CMP to complain of any act or omission on the part of the Licensee, no matter how long the same may continue, will not be deemed a waiver by CMP of any of its rights hereunder. Any waiver by CMP, express or implied, of any breach of this Trail Use Agreement, will not be deemed a waiver of any provision of this Trail Use Agreement or of any subsequent breach of the same or other provision of this Trail Use Agreement. If any action by either party shall require the other's consent or approval, such consent or approval on any particular occasion shall not be deemed a consent or approval of any other action on any subsequent occasion.

#### Section Sixteen - Assignment & Co-Licensee

The purpose of this Trail Use Agreement is to provide public access on the Premises for recreational use under the terms, restrictions and conditions set forth herein. MDOC may assign this License in its entirety with the consent of CMP, said consent may be withheld for any reason including without limitation for any reasons associated with the safe and reliable operation of CMP's facilities as a public utility, or if the assignee cannot demonstrate sufficient resources to comply with the terms and conditions of this Trail Use Agreement. However, MDOC may delegate the construction, maintenance and/or oversight of the Trail, or portions thereof, to one or more Co-Licensee(s). A Co-Licensee may be an organized incorporated recreational club, municipality, quasi-municipal corporation or 501-3C not-for-profit corporation. Any delegation to a Co-Licensee will be made subject to the terms and conditions of this License and such delegation will not relieve MDOC from its obligations of this Trail Use Agreement. It will remain the responsibility of the MDOC to oversee and enforce compliance with all provisions and conditions of this Trail Use Agreement.

#### Section Seventeen - Authorization

Licensee hereby warrants and represents that the execution of this Trail Use Agreement and the carrying out of all acts required of Licensee by the terms of this Trail Use Agreement have been properly and effectively approved and authorized by Licensee in accordance with the Maine State Constitution, and the Maine Revised Statutes.

#### Section Eighteen - Miscellaneous Provisions

##### 18.1. Validate.

If any covenant, provision or condition of this Trail Use Agreement or the application thereof to any person or circumstance shall be declared to any extent to be invalid or unenforceable, the remainder of this Trail Use Agreement, or application thereof will remain in full force and effect. Provided that if any provision limiting CMP liability under Section 10.1 of this Trail Use Agreement or otherwise herein is declared invalid or unenforceable, then CMP shall have the right to immediately terminate this Trail Use Agreement and revoke any future uses of the Premises by Licensee.

18.2. Modifications and Waivers.

No waivers, alterations or modifications of this Trail Use Agreement will be valid unless in writing and duly executed by both parties.

18.3. Choice of Law/Venue.

~~This Trail Use Agreement will be governed by and constructed in accordance with the laws of the State of~~  
Maine. Any action brought in connection herewith shall be brought in the State of Maine in Kennebec County or Cumberland County.

18.4. Captions.

The captions appearing in this Trail Use Agreement are inserted only as a matter of convenience and in no way define, limit, construe or describe the scope or intent of the paragraphs of this Trail Use Agreement or in any way affect this Trail Use Agreement.

18.5. Entire Agreement.

The covenants, provisions and conditions contained in this Trail Use Agreement constitute the entire agreement between the parties and will supersede all previous communications, representations, or agreements either verbal or written between the parties with respect to the Premises and subject matter of this Trail Use Agreement. This Trail Use Agreement may be executed in any number of counterparts, each of which when executed by all parties to this License Agreement shall be deemed to be an original, and all of which counterparts together shall constitute one and the same instrument.

IN WITNESS WHEREOF, the parties have caused their duly authorized representatives to execute this Trail Use Agreement on their behalf as of the date first written above.

## CENTRAL MAINE POWER COMPANY

By

Name: Alice Richards

Its Supervisor, Real Estate Services

STATE OF MAINE  
DEPARTMENT OF CONSERVATION  
BUREAU OF PARKS & LANDS  
OFF-ROAD VEHICLE DIVISION

By:

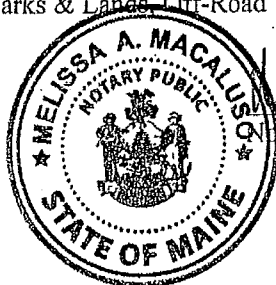
Name: Will Harris

Its Director BP+L

STATE OF MAINE  
Kennebec, ss.

4-7-11, 2011

The above named Willard R Harris, Director Bureau of Parks & Lands  
personally appeared before me and acknowledged the foregoing Trail Use Agreement to be his/her free  
act and deed in his/her said capacity and the free act and deed of said State of Maine, Department of  
Conservation, Bureau of Parks & Lands, Off-Road Vehicle Division.



Melissa A. Macaluso

Notary Public  
MELISSA A. MACALUSO  
Notary Public • State of Maine  
My Commission Expires February 7, 2018

STATE OF MAINE  
Kennebec, ss.

April 1, 2011

The above named Alice Richards, Supervisor, Real Estate Services, Central Maine Power Company,  
personally appeared before me and acknowledged the foregoing Trail Use Agreement to be her free act  
and deed in her said capacity and the free act and deed of said Central Maine Power Company.

Paul Fecteau

Notary Public  
Paul Fecteau, Notary Public  
State of Maine  
My Commission Expires 1/24/2012

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**AMENDMENT TO LICENSE**

This Amendment to License is made as of this 1st day of March, 2006 between Central Maine Power Company, a Maine corporation with an office at 83 Edison Drive, Augusta, Maine 04336 ("Licensor") and Forks Area Chamber of Commerce ("Licensee").

WITNESSETH

WHEREAS, Licensor and Licensee entered into a certain License dated January 13, 2005, and

NOW, THEREFORE, Licensor and Licensee desire to amend said License to add Old Canada Road Scenic Byway, Inc., as a co-licensee.

Except as specifically amended herein, all terms and conditions of the original License shall remain in full force and effect including but not limited to the original License, dated January 13, 2005.

IN WITNESS THEREOF, the parties hereto have caused this Amendment to License to be executed by its duly authorized agent as of the date first written above.

CENTRAL MAINE POWER COMPANY

By

Kenneth H. Freye  
Kenneth H. Freye  
Manager, Real Estate Services

FORKS AREA CHAMBER OF COMMERCE

By

Suzanne Hochmeyer, President  
SUZANNE HOCHMEYER  
PRESIDENT

OLD CANADA ROAD SCENIC BYWAY, INC.

By

Robert Haynes  
Robert Haynes  
Coordinator

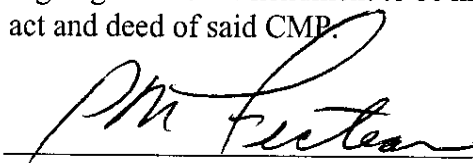


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STATE OF MAINE  
Kennebec, ss.

3/1, 2006

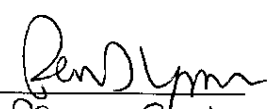
The above named Kenneth H. Freye, Manager, Real Estate Services, CMP, personally appeared before me and acknowledged the foregoing License Amendment to be his free act and deed in his said capacity and the free act and deed of said CMP.

  
Notary Public  
Paul Fecteau, Notary Public  
State of Maine  
My Commission Expires 1/24/2012

STATE OF MAINE  
Somerset, ss.

2/28, 2006

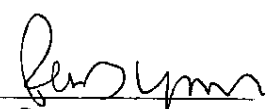
The above named Suzanne Hockmeyer, President, Forks Area Chamber of Commerce, personally appeared before me and acknowledged the foregoing License Amendment to be her free act and deed in her said capacity and the free act and deed of the said Forks Area Chamber of Commerce.

  
Notary Public PETER G. LYMAN  
COMM. EXPIRES 6/11/09

STATE OF MAINE  
Somerset, ss.

2/28, 2006

The above named Robert Haynes, Coordinator, Old Canada Road Scenic Byway, Inc., personally appeared before me and acknowledged the foregoing License Amendment to be his free act and deed in his said capacity and the free act and deed of said Old Canada Road Scenic Byway, Inc.

  
Notary Public PETER G. LYMAN  
COMM. EXPIRES 6/11/09

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## LICENSE

**THIS LICENSE** is made this 13<sup>th</sup> day of January, 2005 by and between **CENTRAL MAINE POWER COMPANY**, a Maine corporation having its principal place of business at 83 Edison Drive, Augusta, ME 04336 ("CMP") and the Forks Area Chamber of Commerce ("Licensee"). CMP hereby grants to Licensee the right to use, for the purposes described below, the following described premises ("Premises") under the following conditions:

### Section One - Premises

The attached map identifies the general location of the Trail. A more detailed description will be forwarded to CMP no later than June 30, 2005 after the Trail has been GPS'd by the Licensee.

### Section Two - Term and Rent

The term of this License is for one (1) year commencing on the date of execution of this License. This License shall be renewed perpetually for additional one- (1) year terms unless either party gives the other written notice of its intent to terminate the License at least ninety (90) days prior to the end of the then current term.

CMP shall receive recognition for its contribution in granting use of the Premises on signs erected on the Premises and in printed material that publicizes the Trail. In the event CMP provides Licensee with recognition signs, Licensee will place them in appropriate locations along the trail.

No payment or consideration other than the mutual covenants contained herein shall be paid for this License.

### Section Three - Specific Use

Licensee's use of the Premises shall not endanger health, create a nuisance, or be incompatible with CMP's use of the Premises.

Licensee may only use the Premises for a 12-foot wide public recreational trail ("Trail"). The Trail shall be designed and designated so that it will not be used by certain motorized vehicles such as ATV's, dirt bikes and other off-road vehicles. Seasonal snowmobile use, however, will be permitted along designated segments of the Trail. This use restriction is not intended to preclude use by motorized wheelchairs and by motorized vehicles engaged in construction, maintenance or repair of the Trail, as provided below. The Premises shall not be used for camping or for any other use without prior written approval from CMP.

Licensee may install minor improvements such as culverts, bridges, observation decks with railings, safety barriers and signs, provided that they do not interfere with CMP's operations, as determined solely by CMP. Licensee, or its agents, may use necessary motorized vehicles for installation of trail improvements and for trail maintenance as outlined in Section Six herein.

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CMP Non-Motorized Trail License, Rev. 04-22-2004  
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Licensee's rights under this License are subject to any rights CMP has granted to third parties, even if such rights interfere with Licensee's use of the Premises. CMP also reserves the right to grant rights to third parties for use of all or part of the Premises, even if such rights interfere with Licensee's use of the Premises. However, CMP shall work with Licensee to minimize the impact on the Trail. Neither CMP nor CMP's assignees shall be liable to Licensee for any damage to Licensee's property or interference with Licensee's use of the Premises.

#### **Section Four – Approval and Timing**

Upon execution of this License, Licensee shall promptly seek and make reasonable effort to obtain all necessary federal, state and local approvals, licenses and permits. Licensee shall not undertake any construction or installation until Licensee and CMP (if necessary) have procured all necessary permits or governmental approvals. Licensee also will assure that its use of the Trail is in compliance with all applicable regulations, including, but not limited to, Department of Environmental Protection wetland regulations.

Prior to the cutting or trimming of any trees on the Premises, Licensee will notify appropriate CMP Vegetation Management personnel and subsequently comply with all requirements and conditions of said tree work and removal as set forth by said CMP representatives.

No signs, trail markers, reflectors, or notices of any kind will be attached to CMP structures located in the areas where the Trail will cross State Route 201 and Moxie Dam Road.

No portion of said Trail shall pass between poles on a multi-pole structure, or within fifteen (15') feet of any pole or guy wire. However, if in its final design and layout, a portion of the Trail is found to pass within 15' of a transmission pole or guy wire, the Licensee must construct barriers between said pole or guy wires and the Trail which are adequate to protect them from damage. Said barriers shall be approved with respect to design, composition, and installation in writing by appropriate CMP representatives prior to their installation. The construction and maintenance of said barriers, as well as any relocation by CMP of its transmission poles or guy wires to accommodate the provisions of this License shall be at the Licensee's sole cost and expense.

Prior to any excavation of the Premises, Licensee will notify the Dig Safe Call Center at 1-888-DIG-SAFE and comply with the provisions of both the Maine Dig Safe Statute, M.R.S.A., Title 23, Section 3360-A and the Overhead High-Voltage Line Safety Act, M.R.S.A., Title 35A, Section 751, et seq., Chapter 7-A. In the event that Licensee or CMP does not receive any necessary permits or approvals within one (1) year of the commencement of this License, and the parties have not previously agreed to an extension of this time frame, this License shall be null and void and CMP and Licensee shall have no further obligations to each other with respect to the subject matter of this License, except for Licensee's obligations under Section Ten below.

#### **Section Five - Waste**

Licensee shall take all reasonable precautions to ensure that construction, operation and maintenance of the Trail and all associated uses will occur in a manner that will protect the scenic, recreational, and environmental values of the Premises. Licensee will not make or suffer any waste of the Premises.

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CMP Non-Motorized Trail License, Rev. 04-22-2004  
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### **Section Six - Operation and Maintenance**

Licensee shall perform or arrange for the performance of routine and major maintenance and repair of all improvements related to the construction and use of the Trail located on the Premises by or for Licensee, so that they remain orderly and safe. Licensee shall also take reasonable steps to keep the Premises free of all litter, such as cans and paper goods. Licensee shall also maintain the Trail in a safe condition, including grading, bridge and culvert construction, maintenance of vegetation affecting the Trail and maintenance of all non-CMP mandated signs. Licensee shall, through its regular publications to its members and public notices relating to the Premises, inform its members and the public of the uses of the Premises permitted under this License. Licensee shall also, through its stewardship program, make reasonable efforts to enforce compliance with such uses and prevent harm or damage to the Premises, including dumping.

CMP may periodically inspect the Premises to determine if maintenance may be necessary and shall notify Licensee within a reasonable time period after discovery by CMP of any necessary maintenance to be performed by Licensee.

In event that Licensee fails promptly to perform its obligations under this Section, CMP may, fourteen (14) days after mailing written notice to Licensee, perform the obligation and invoice Licensee for the reasonable cost of performing the obligation, which costs Licensee shall promptly pay. CMP is under no obligation to perform Licensee's obligations.

### **Section Seven - Requirements of Law**

Licensee and CMP shall comply with all governmental laws, orders, ordinances and regulations and with any lawful order of any public officer or officials.

### **Section Eight - Surrender of Premises**

Upon expiration of the term or other termination of this License, whether by reason of lapse or time or Licensee's default or otherwise, Licensee shall quit and surrender the Premises, together with all improvements thereon, to CMP in as good order and conditions as they are in or may be put into by CMP or Licensee, except for ordinary wear and tear.

### **Section Nine - Insurance**

Licensee covenants and agrees, at its sole cost and expense, to obtain, keep, and maintain in full force and effect for the term of this License and any extension thereof for the mutual benefit of CMP and Licensee, a comprehensive general liability insurance policy against claims for damage to persons and property arising out of the use and occupancy of the Premises or any part or parts thereof, with a combined single limit of One Million Dollars (\$1,000,000.00) with no more than a ~~Five~~ <sup>Ten</sup> Thousand Dollar (\$10,000.00) deductible.

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All insurance required under this Section shall name CMP as an additional insured and shall be issued by an insurer rated B+13 by the latest Best's rating guide. Licensee shall provide CMP with a Certificate of Insurance prior to the commencement of this License. Such Certificate shall state that no material change or cancellation of the insurance coverage can be effective unless and until ten (10) days prior written notice has been given to CMP for cancellation for non-payment and thirty (30) days prior written notice for all other reasons for change or cancellation. Should any policy be canceled during the term of this License and Licensee fails to immediately procure equivalent insurance, CMP shall have the right, at its option but without any duty to do so, to: (1) cancel this License at the lapse of the policy; or, (2) to procure such insurance and to pay the premiums therefor, and all such premiums paid by CMP together with interest from the time of payment until repaid by Licensee, shall be repaid to CMP on demand as additional rent, and, without limiting CMP's remedies, Licensee's failure to repay the same, shall constitute a default under this License.

### **Section Ten – Release / Indemnification**

Licensee is fully familiar with the physical condition of the Premises. CMP has made no representations of whatever nature in connection with the title to or condition of the Premises and Licensee accepts the Premises "as is". Without limiting the foregoing, CMP does not warrant or represent that it has sufficient interest in all or any part of the Premises for Licensee to exercise the rights described herein. CMP shall not be liable for any latent or patent defects therein.

Neither CMP, nor its parent company or their affiliates, and its and their directors, officers, employees, agents, contractors, successors and assigns shall be liable for, and Licensee hereby releases them from, all claims of any kind or nature, including but not limited to claims for loss of life, personal injury or damage to property sustained by Licensee or any person claiming through Licensee resulting from any accident, occurrence or condition in or upon the Premises or related to this License, except for damage caused solely by negligent acts of CMP.

Licensee shall be responsible for any and all damage and related costs caused by the existence of any toxic or hazardous matter, substance or waste caused or allowed, with knowledge of the Licensee, to be brought onto the Premises by Licensee or its employees, members, officers, directors, contractors, agents or invitees during the term of this License or any extension thereof, unless placed there by CMP, and shall indemnify and hold harmless CMP and its parent company or their affiliates, and its and their directors, officers, employees, agents, contractors, successors and assigns from and against all claims, actions, damages, liability and expense, including attorneys' fees, arising from or out of the existence of such hazardous matter, substance or waste.

Licensee shall also pay all costs, expenses and reasonable attorneys' fees that may be expended or incurred by CMP in successfully enforcing the terms of this License.

The provision of this Section shall survive cancellation or termination of this License.

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### Section Eleven - Default

Licensee shall be deemed to be in default under the License if it fails to fully comply with any term or condition of this License within thirty (30) days after receipt of written notice from CMP of any such failure to correct the conditions specified in the notice; provided that if such condition cannot reasonably be cured within thirty (30) days, Licensee shall not be in default if it promptly commences the cure and continues diligently. However, Licensee may be required to correct the condition causing the breach in less than thirty (30) days if necessary to protect the public health or safety, abate a nuisance, or prevent damage to the Premises.

If an event of default occurs as described above, CMP shall have the option to pursue one or more of the following remedies, without notice or demand, in addition to any other remedies provided in this License, in equity or at law:

- a. terminate this License; and
- b. recover from Licensee all damages proximately resulting from the breach, which damages shall be deemed to include without limitation, damages to the Premises, the cost of recovering the Premises, and CMP's reasonable attorney's fees necessary to enforce obligations under this License.

### Section Twelve - Notices

Any notice under this License shall be in writing and shall be deemed to be delivered when mailed by registered or certified mail, postage prepaid, addressed to the address of such party set forth below.

#### LICENSEE

The Forks Area Chamber of Commerce  
P.O. Box  
The Forks, Maine 04920

#### CMP

Central Maine Power Company  
CMP Real Estate Services  
83 Edison Drive  
Augusta, ME 04336

Either party may change its above address by giving notice of the change to the other party of such change of address to become effective for all purposes hereunder three (3) days after such notice is given.

### Section Thirteen - Contact Person

In order to facilitate communication between CMP and Licensee, each party will designate a contact person for communications necessary under this License other than formal notices, which notices shall be sent in accordance with the written notice provisions of this License.

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### **Section Fourteen - No Waiver**

Failure of CMP to complain of any act or omission on the part of the Licensee, no matter how long the same may continue, shall not be deemed to be a waiver by said CMP of any of its rights hereunder. No waiver by CMP at any time, express or implied, of any breach of any provision of this License, shall be deemed a waiver of such provision or of a subsequent breach of the same of any other provision.

### **Section Fifteen - Assignment**

Licensee shall not assign this License or its rights hereunder nor sublet the Premises or any part thereof without the prior written consent of CMP.

### **Section Sixteen - Authorization**

Licensee hereby warrants and represents that the execution of this License and the carrying out of all acts required of Licensee by the terms of this License have been properly and effectively approved and authorized by Licensee in accordance with the Maine State Constitution, the Maine Revised Statutes, and the Articles of Incorporation and Bylaws of Licensee.

### **Section Seventeen - Miscellaneous Provisions**

If any covenant, provision or condition of this License or the application thereof to any person or circumstances shall be declared to any extent to be invalid or unenforceable, the remainder of this License, or application thereof shall remain in full force and effect.

This License shall inure to and be binding upon the respective successors and permitted assigns of the parties.

No waivers, alterations or modifications of this License shall be valid unless in writing and duly executed by both parties.

This License shall be governed by and constructed in accordance with the laws of the State of Maine.

The captions appearing in this License are inserted only as a matter of convenience and in no way define, limit, construe or describe the scope or intent of the paragraphs of this License or in any way affect this License.

The covenants, provisions and conditions contained in this License constitute the entire agreement between the parties and shall supersede all previous communications, representations, or agreements either verbal or written between the parties with respect to the subject matter of this License.

**IN WITNESS WHEREOF**, the parties have caused their duly authorized representatives to execute this License on their behalf as of the date first written above.

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CMP Non-Motorized Trail License, Rev. 04-22-2004  
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## CENTRAL MAINE POWER COMPANY

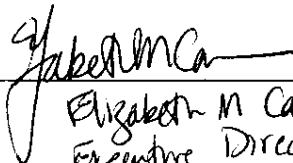
By

  
Kenneth H. Freye  
Manager, Real Estate Services

## THE FORKS AREA CHAMBER OF COMMERCE

By

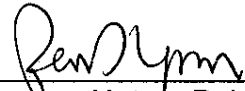
Name:

  
Elizabeth M. Caruso  
Executive Director

STATE OF MAINE

SOMERSET, ss.1/31, 2005

The above named ELIZABETH M. CARUSO personally appeared before me and acknowledged the foregoing License to be his free act and deed in his said capacity and the free act and deed of said The Forks Area Chamber of Commerce.


  
Notary Public Peter G. Lyman  
Comm. Expires 6/11/2009

STATE OF MAINE

Kennebec, ss.

1-13, 2005

The above named Kenneth H. Freye, Manager, Real Estate Services, Central Maine Power Company, personally appeared before me and acknowledged the foregoing License to be his free act and deed in his said capacity and the free act and deed of said Central Maine Power Company.

  
Notary Public  
ERIC D. ROACH  
NOTARY PUBLIC, MAINE  
MY COMMISSION EXPIRES:  
FEBRUARY 4, 2009



## RECIPROCAL EASEMENT AGREEMENT

This Reciprocal Easement Agreement (this “**Agreement**”) is effective as of the 15<sup>th</sup> day of January, 2019, (the “**Effective Date**”) by and between **WEYERHAEUSER COMPANY**, a Washington corporation, (“**Weyerhaeuser**”), and **CENTRAL MAINE POWER COMPANY**, a Maine corporation with an address of 83 Edison Drive, Augusta, Maine 04364 (“**CMP**”). Weyerhaeuser and CMP are sometimes referred to herein individually as a “**Party**”, and collectively as, the “**Parties**”.

### RECITALS

Weyerhaeuser owns certain real property located in Somerset County, Maine and more particularly described in the attached Exhibit A, Sheets 1 through 3 (“**Weyerhaeuser’s Property**”).

CMP owns certain real property located in Somerset County, Maine and more particularly described in the attached Exhibit B, Sheets 1 and 2 (“**CMP’s Property**”).

Weyerhaeuser desires to grant CMP a perpetual, non-exclusive easement over a certain road located on Weyerhaeuser’s Property that provides access to CMP’s Property.

CMP desires to grant Weyerhaeuser a perpetual, non-exclusive easement over a certain road located on CMP’s Property that provides access to Weyerhaeuser’s Property.

### AGREEMENT

NOW, THEREFORE, in consideration of TEN and NO/100 DOLLARS (\$10), and the mutual covenants of the Parties set forth in this Agreement, and other good and valuable consideration, the receipt and sufficiency of which are hereby acknowledged, the Parties, intending to be legally bound, agree as follows:

#### 1. Grant of Easements.

1.1 Subject to the terms hereof, Weyerhaeuser, for and in consideration of the reciprocal easement granted in subsection 1.2 below, hereby grants and conveys to CMP a private, perpetual, non-exclusive right of way easement (“**CMP’s Easement**”) fifty (50) feet in width, being twenty-five (25) feet on either side of the center line of the existing road located upon Weyerhaeuser’s Property (“**Weyerhaeuser Road**”). CMP’s Easement and the Weyerhaeuser Road are located approximately as shown on the map attached hereto as Exhibit A, Sheets 1 through 3. CMP’s Easement shall be subject and subordinate to all liens, leases, easements, servitudes, rights-of-way, prescriptive rights, reservations, conveyances and any and all other matters of record or apparent encumbering Weyerhaeuser’s Property (“**Weyerhaeuser’s Permitted Encumbrances**”), it being distinctly understood and agreed by the Parties that Weyerhaeuser, by this grant, grants no greater rights than it is permitted to grant in view of any of Weyerhaeuser’s Permitted Encumbrances.

1.2 Subject to the terms hereof, CMP, for and in consideration of the reciprocal easement granted in subsection 1.1 above, hereby grants and conveys to Weyerhaeuser a private, perpetual, non-exclusive right of way easement ("**Weyerhaeuser's Easement**") sixty-six (66) feet in width, being thirty-three (33) feet on either side of the center line of the existing road located upon CMP's Property ("**CMP's Road**"). Weyerhaeuser's Easement and CMP's Road are located approximately as shown on the map attached hereto as Exhibit B, Sheets 1 and 2. Weyerhaeuser's Easement and CMP's Easement are sometimes hereinafter collectively referred to as the "**Easements**" and Weyerhaeuser's Road and CMP's Road are sometime hereinafter collectively referred to as the "**Roads**". Weyerhaeuser's Easement shall be subject and subordinate to all liens, leases, easements, servitudes, rights-of-way, prescriptive rights, reservations, conveyances and any and all other matters of record or apparent encumbering CMP's Property ("**CMP's Permitted Encumbrances**"), it being distinctly understood and agreed by the Parties that CMP, by this grant, grants no greater rights than it is permitted to grant in view of any of CMP's Permitted Encumbrances.

2. **Purpose of Easements.** CMP's Easement is conveyed by Weyerhaeuser for the purpose of providing CMP vehicular ingress and egress over and across Weyerhaeuser's Property solely for the purpose of forest management, log transport and the transportation of other forest products, rock and equipment, and construction, reconstruction or maintenance of Weyerhaeuser's Road. Weyerhaeuser's Easement is conveyed by CMP for the purpose of providing Weyerhaeuser vehicular ingress and egress over and across CMP's Property solely for the purpose of forest management, log transport and the transportation of other forest products, rock and equipment, and construction, or reconstruction and/or maintenance of CMP's Road.

3. **Permittees.** Weyerhaeuser, its subsidiaries, and affiliates and all of their employees, agents, contractors, licensees, lessees, invitees, and assigns are sometimes referred to herein collectively as the "**Weyerhaeuser Permittees**". CMP's employees, agents, contractors, licensees, lessees, invitees, and assigns are sometimes referred to herein collectively as "**CMP Permittees**". The term "Respective Permittees" is used herein to refer to the Weyerhaeuser Permittees for Weyerhaeuser and the CMP Permittees for CMP.

4. **Reservation of Rights.** Weyerhaeuser reserves for itself and the Weyerhaeuser Permittees the right at all times for any purpose, to cross and re-cross Weyerhaeuser's Roads in any manner that will not unreasonably interfere with the rights of CMP. CMP reserves for itself and the CMP Permittees the right at all times for any purpose, to cross and re-cross CMP's Roads in any manner that will not unreasonably interfere with the rights of the Weyerhaeuser.

5. **Nonexclusive Easement; Third Parties.** Weyerhaeuser may grant to third parties including (without limitation) the Weyerhaeuser Permittees, upon such terms Weyerhaeuser may choose in Weyerhaeuser's reasonable discretion, the rights to use the Weyerhaeuser Road; provided that use of the Weyerhaeuser Road by such third parties and the Weyerhaeuser Permittees shall not unreasonably interfere with the rights granted to CMP in this Agreement. CMP may grant to third parties including (without limitation) the CMP Permittees, upon such terms CMP may choose in CMP's reasonable

discretion, the rights to use the CMP Road; provided that use of the CMP Road by such third parties and the Weyerhaeuser Permittees shall not unreasonably interfere with the rights granted to the Weyerhaeuser in this Agreement.

6. **Road Maintenance.** The cost of road maintenance and resurfacing shall be allocated between the Parties on the basis of respective uses of the Roads. When any Party uses one or both Roads, that Party shall perform or cause to be performed, or contribute or cause to be contributed, that share of maintenance and resurfacing occasioned by such use as hereinafter provided. During periods when the Roads or portions thereof are solely used by one Party, such Party shall maintain all or portions of the Roads so used to the standards existing at the time use is commenced. During periods when more than one Party is using the Roads or portions thereof, the Parties hereto shall meet and establish necessary maintenance provisions. Such provisions shall include, but shall not be limited to (a) the appointment of a maintainer, which may be one of the Parties hereto or any third party, who will perform or cause to be performed at a reasonable and agreed upon rate the maintenance and resurfacing of the Roads or portions thereof being used; and (b) a method of payment by which each Party using the Roads or portions thereof, shall pay its pro rata share of the cost incurred by the maintainer in maintaining or resurfacing the Roads or portion thereof. For purposes of this Agreement, maintenance is defined as the work normally necessary to preserve and keep the roadway, road structure and road facilities as nearly as possible in their present condition or as hereafter improved.

7. **The Parties Responsibilities.** Each Party shall:

7.1 Take all reasonable precaution to prevent unauthorized persons from using the Roads;

7.2 Keep all existing gates, and any that may be installed on the Roads in the future, closed and locked; provided, however, that the Parties may, from time to time leave gates (if any) on the Roads open for reasonable extended periods during regular business hours in order to facilitate active timber harvest of the Parties;

7.3 Not drive with excessive speed upon the Roads;

7.4 Immediately report to each other any dangerous or defective condition with respect to any portion of the Roads;

7.5 Ensure that each Party and their Respective Permittees comply with all applicable local, state and federal laws, rules and regulations (collectively, "**Applicable Laws**") with respect to the use of the Roads;

7.6 Ensure that any exercise of rights under this Agreement by itself and its Respective Permittees shall not unreasonably obstruct, interfere with or prevent the use and enjoyment of the other Party's Property (including but not limited to the Parties' respective Easements and Roads) by such Party or its Respective Permittees; and

7.7 Comply with all reasonable road rules, regulations and restrictions (“**Road Rules**”) that each Party may, from time to time, promulgate in its sole and absolute discretion, including (without limitation) restrictions on weight, speed and use during adverse weather or fire conditions reasonably necessary to protect the Roads and adjacent timber, provided that the other Party is given a prior written notice of such Road Rules and such Road Rules do not materially impair the other Party’s use of the Roads.

8. **Gate Keys and Combinations.** Each Party shall provide another with combination to any gate that must be opened to access the Roads by entering a combination. Should the locks to the gate require a key, each Party shall provide another with a key to such a gate. Each Party may change the gate combinations or key locks at any time, for any reason, or may, at the sole cost of the initiating Party, modify the gate to accommodate a dual lock system; provided, however, that prior to changing the combinations or keys or modifying the gate, each Party shall notify another of the new combination or the need to obtain a new key or the pending modification.

9. **Indemnity.** Each Party agrees to defend, indemnify, save, protect and hold harmless the other Party for, from and against all causes of action, litigation, cost, loss, liability, damage and expense (including attorneys’ fees) for injury or death to persons, whomsoever, and damage to or loss of property, to whomsoever belonging, including (without limitation) the Parties’ Respective Permittees, arising out of or in any way connected with the use of the Easements or Roads by such Party and its Respective Permittees; unless such causes of actions, litigation, cost, loss, liability, damage and expense results from the sole negligence of the other Party.

10. **Timber.** Each Party reserves to itself all timber now on or hereafter growing within the portion of the Easements located on their respective properties.

11. **Insurance.** The Parties shall maintain for themselves and their Respective Permittees, policies of insurance with companies maintaining an AM Best Rating of A-VII or better in the following minimum amounts:

Automobiles

|                 |                             |
|-----------------|-----------------------------|
| Bodily Injury   | \$1,000,000 Each Occurrence |
| Property Damage | \$1,000,000 Each Occurrence |

Commercial General Liability

|               |                                                       |
|---------------|-------------------------------------------------------|
| Bodily Injury | \$1,000,000 Each Occurrence-<br>\$2,000,000 Aggregate |
|---------------|-------------------------------------------------------|

|                 |                                                      |
|-----------------|------------------------------------------------------|
| Property Damage | \$1,000,000 Each Occurrence<br>\$2,000,000 Aggregate |
|-----------------|------------------------------------------------------|

|                           |                             |
|---------------------------|-----------------------------|
| Or Combined Single Limits | \$1,000,000 Each Occurrence |
|---------------------------|-----------------------------|



Minimum amounts of insurance shall be subject to such other limits as the Parties hereto may agree upon in writing from time to time. Commercial general liability insurance shall include coverage for: operations and completed operations; independent contractors; blanket contractual liability (including liability assumed under the indemnification paragraph of this Agreement); and automobile liability insurance covering owned, hired and non-owned vehicles (including, if applicable, the "pollution from autos endorsement," 150 Form No. CA 99 48). Each Party shall also maintain at all times State or private industrial accident insurance covering such Party and their Respective Permittees which shall fully comply with State and Federal employment and workers' compensation laws. Each Party shall deliver to another a certificate or certificates (as applicable) from their respective insurer or insurers stating that all applicable insurance required hereunder is in full force and effect, and that the insurer or insurers (as applicable) will give to another Party thirty (30) days written notice prior to any cancellation or modification of the applicable insurance together with evidence that all owned, non-owned vehicles to be used by a Party are covered by such insurance. The aggregate limits shall be specific to this Agreement. A one million dollar (\$1,000,000) Umbrella Policy may be used in lieu of per project aggregate. Upon the request of either Party, the road user shall deliver to the requesting Party certificates from the road user's insurance carrier evidencing the insurance coverage required under this Section. Prior to permitting its Respective Permittees to exercise any rights granted herein for commercial purposes, each Party agrees it will require its Respective Permittees to first obtain, and maintain at all times while operating under this Agreement, insurance coverage in the amounts not less than described above. Each Party further agrees it will require its Respective Permittees to have available upon request a certificate from the insurer evidencing that such coverage is in force. Neither Party shall allow the coverages set forth in this Section to be cancelled or modified without giving each Party at least ten (10) days' written notice prior to any cancellation or modification of such coverage.

12. **Assignment.** Each Party may assign its rights and obligations under this Agreement without the prior written consent of the other Party.

13. **Title.** Neither Party warrants the title to the land traversed by the other Party pursuant to this Agreement; neither Party shall have liability of any kind or nature to the other in the event of failure of the title

14. **Land Uses and Practices.** CMP recognizes that Weyerhaeuser's lands in the area are managed for commercial forestry including logging, slash burning, other fire control, silvicultural site preparation, forest roads, aerial and ground application of forest chemicals, and other silvicultural practices which often create noise, dust, visual impacts and other alterations of the forest environment. In conducting such operations Weyerhaeuser will comply with all laws and regulations applying in commercial forest areas. No additional restrictions shall be imposed on Weyerhaeuser's forest management operations because of proximity to any uses of CMP's lands dependent on or facilitated by the rights of CMP under this Agreement.

15. **Environmental Matters.** The Parties are prohibited from managing, using, transporting, generating and disposing of any Hazardous Substance in violation of Environmental Laws or substances deemed illegal under Applicable Laws on the Easements, Roads, or the Parties' respective properties. For purposes of this Agreement, the term "**Environmental Laws**" means any federal, state, local law, statute, ordinance, regulation or order and all amendments thereto pertaining to human health, environmental conditions or Hazardous Substances applicable to Weyerhaeuser's Property and CMP's Property, including (without limitation) the Endangered Species Act, 16 U.S.C. § 1531-1544 (1998) and any Amendments thereto (the "**ESA**"). For purposes of this Agreement, the term "**Hazardous Substance**" shall mean any hazardous or toxic substances, materials or wastes, or pollutants or contaminants as defined, listed or regulated by any Environmental Laws or by common law decision including, without limitation, chlorinated solvents; petroleum products or by-products; asbestos; and polychlorinated biphenyl. In addition to all other indemnities set forth herein, each Party shall save, protect, defend, indemnify, and hold harmless the other Party, its respective property and Respective Permittees, from and against any and all loss, damage, cost, expense, or liability (including reasonable attorney fees) and the reasonable costs of repairs and improvements necessary to return the Easements, Roads, the respective property or any other lands owned by such Party to the physical condition existing prior to undertaking any activity related to any Hazardous Substance to the extent arising out of or attributable to the indemnifying Party's use, manufacture, storage, release, or disposal of a Hazardous Substance or other illegal substance thereupon in violating Applicable Laws, including (without limitation) Environmental Laws. This indemnity shall survive the expiration or earlier termination of this Agreement.

16. **Road Damage and Improvements.** Each Party using any portion of the Roads shall repair, or cause to be repaired, at its sole cost and expense, that damage to the Roads occasioned by it which is in excess of that which it would cause through normal and prudent usage of the Roads. Should inordinate damage to the Roads occur which is not caused by an authorized user of the Roads, the Parties hereto shall meet to agree upon the cost of replacement, the Party to undertake the replacement, and the shares of replacement cost to be borne by each user of the Roads. Unless the Parties hereto agree in writing to share the cost of improvements in advance of such improvements being made, such improvements shall be solely for the account of the improver.

17. **Fire Suppression and Control.** Each Party warrants, represents and covenants that it shall:

17.1 Maintain as part of its operation in good and useable condition all the tools and equipment necessary to prevent and suppress fires as required by all Applicable Laws;

17.2 Dispose of all slashings and debris created by a Party on the Roads or their respective properties in a commercially reasonable manner;

17.3 Maintain the Roads free of inflammable debris; and

17.4 Upon discovery of fire in the vicinity of the Roads or a Party's operations, immediately notify appropriate governmental agencies, the other Party and the nearest official forest officer in charge of forest fire control.

18. **Independent Contractor.** It is agreed that neither Party hereto is the agent, servant, or employee of the other Party for any purpose whatsoever.

19. **Counterparts.** This Agreement may be executed in any number of counterparts, whether by facsimile transmission, electronic .pdf version or otherwise, each of which shall be deemed to be an original but all of which together shall constitute one and the same instrument.

20. **No Third-Party Beneficiaries.** Nothing in this Agreement, express or implied, is intended to confer on any person other than the Parties hereto and their respective successors and permitted assigns any rights, remedies, obligations or liabilities under or by reason of this Agreement.

21. **Force Majeure.** The Parties shall be free from any liability to one another for delays in delivery or failure to perform due to the failure, fault, or bankruptcy of a third party, acts of God, acts of default of any carrier, acts of any governmental authority, terrorism, suspension of any shipping facility, wars, riots, revolutions, strikes and other labor disputes, port congestion, fires, floods, perils of the sea, sabotage, nuclear incidents, earthquakes, storms, epidemics, or any other contingency of any similar nature beyond the control of either Party. The foregoing shall apply even though any of such causes exist as of the date of this Agreement or occurs after performance is delayed for other causes.

22. **Amendment; Successors and Assigns.** This Agreement may be modified or amended only by a written agreement signed by the Parties, or their applicable permitted successors or assigns. All terms, conditions, representations, and covenants of this Agreement shall be binding upon and inure to the benefit of the Parties, their heirs, successors and assigns. The rights of CMP hereunder shall be appurtenant to and for the benefit of CMP's Property and any conveyance of CMP's Property shall include a conveyance of CMP's Easement, regardless of whether CMP's Easement is specifically identified in the instrument of conveyance. The rights of Weyerhaeuser hereunder shall be appurtenant to and for the benefit of the Weyerhaeuser's Property and any conveyance of CMP's Property shall include a conveyance of the Weyerhaeuser's Easement, regardless of whether the Weyerhaeuser's Easement is specifically identified in the instrument of conveyance.

23. **Prior Rights.** This grant and all rights hereunder are subject to all liens, easements, servitudes, rights of way, oil, gas, and mineral leases, and all other grants or reservations either of record or on the ground affecting the Weyerhaeuser Property. By this grant, Weyerhaeuser grants no greater rights than it is permitted to grant in view of such encumbrances.

24. **Severability; Relation to Existing Law.** If any provision of this Agreement is invalid, illegal or incapable of being enforced by any rule of law, or public policy, all other conditions and

provisions of this Agreement shall nevertheless remain in full force and effect so long as the economic or legal substance of the transactions contemplated hereby is not affected in any manner adverse to any Party. Upon any such determination, the Parties hereto shall negotiate in good faith to modify this Agreement so as to affect the original intent of the Parties as closely as possible in an acceptable manner to the end that transactions contemplated hereby are fulfilled to the extent possible. Notwithstanding any other provision of this Agreement, the invalidation of any provision herein relating to the Parties' remedies shall not be interpreted to prevent an injured Party from seeking actual damages. If subsequent to the date of this Agreement valid State or Federal laws or regulations governing the relationship between Weyerhaeuser and CMP take effect, this Agreement shall be considered to incorporate such laws or regulations so long as they shall be effective, and any provision of this Agreement in conflict therewith shall during such period be void.

25. **Waiver.** No failure of either Party to exercise any power given hereunder or to insist upon strict compliance with any obligations specified herein, and no custom or practice at variance with the terms hereof, shall constitute a waiver of any Party's right to demand strict compliance with the terms hereof; provided, however, that any Party may, at its sole option, waive any requirement, covenant or condition herein established for the benefit of such Party without affecting any of the other provisions of this Agreement.

26. **Subordination.** Any mortgage or deed of trust affecting any portion of the Weyerhaeuser's Easement or CMP's Easement shall at all times be subject and subordinate to the terms and conditions of this Agreement, and any party foreclosing any such mortgage or deed of trust, or acquiring title by deed in lieu of foreclosure or trustee's sale, shall acquire title subject to all the terms and conditions of this Agreement.

27. **Entire Agreement; Construction.** This Agreement sets forth the entire and complete agreement between the Parties with respect to the subject matter hereof. Any prior agreements, commitments, or representations, express or implied, between the Parties are superseded by this Agreement. This Agreement may be altered, amended, or repealed only by a written instrument executed by both Parties. No provisions of this Agreement shall be construed against or interpreted to the disadvantage of any Party hereto by any court or governmental or jurisdictional authority by reason of such Party having been deemed to have structured, written, drafted or dictated such provisions. The Recitals to this Agreement and the Exhibits attached to this Agreement are incorporated herein by this reference. The captions and headings of this Agreement are for convenience only and shall not define, limit, or describe the applicability, scope, meaning, or intent of any provision of this Agreement. Capitalized terms which are defined in the recitals hereof shall have the meaning given.

28. **Attorneys' Fees.** In the event any arbitration, action, suit or legal proceeding is instituted by either Party to this Agreement, the prevailing Party shall be entitled to recover from the non-prevailing Party both reasonable attorney fees and reasonable expert witness fees as determined by the court or arbitration panel, both at trial and on appeal or review and in bankruptcy, whether



or not the matter in dispute involves an issue peculiar to federal bankruptcy law. Attorney fees and expert witness fees shall be in addition to other costs and disbursements allowed by law. **"Prevailing Party"** shall be determined by the arbitrator, or any court, as the true prevailing party (not statutorily prevailing party) after taking into consideration any settlement offers made by the Parties and the number and importance of issues to be determined.

29. **Disputes.** If disputes arise under this Agreement, the Parties will first attempt to negotiate a solution through the following process: (a) the initiating party will present a written explanation of the dispute and the remedy requested; (b) within 14 business days after receiving such a statement, the other party will respond by either agreeing to the requested remedy, counter-proposing a different remedy, or explaining why the issue does not justify any remedy; and (c) if the matter is not settled within 10 days after the response is received by the initiating party, the dispute shall be settled by binding arbitration. If the Parties are not able to promptly agree on an arbitrator and the arbitration rules to be used, the initiating party may offer a list of at least 5 candidates for arbitrator and the arbitration rules each candidate would use if selected, and the responding party will choose the arbitrator from that list. Each candidate must have at least 15 years of real estate law experience and special training or experience in arbitration of business disputes. The arbitration award shall be final and binding on the parties and judgment on any award may be enforced in any court having jurisdiction thereof.

30. **Notices.** All notices required or permitted to be given hereunder, or given in regard to this Agreement by one Party to the other, shall be in writing and the same shall be given and be deemed to have been served, given and received (i) if delivered by hand, when delivered in person, (ii) if sent by reputable overnight courier (such as Federal Express or UPS), on the next business day following the date on which the notice was sent, or, or (iii) if mailed, when placed in the United States mail, postage pre-paid, by certified mail, return receipt requested, addressed to the Party at the address hereinafter specified. Any Party may change its address or facsimile number for notices by giving five days advance written notice to the other Party hereto in the manner provided for herein. Until changed in the manner provided herein, the Parties' respective addresses and facsimile numbers for notices hereunder are as follows:

If to Weyerhaeuser:

Weyerhaeuser Company  
Ben Dow  
49 Mountain Ave.  
Fairfield, Maine 04937-0089 --

With a copy to:

Weyerhaeuser Company  
Law Dept. HQ7  
220 Occidental Avenue South  
Seattle, Washington 98104

If to CMP:

Central Maine Power Company  
Att. Brian Berube  
Real Estate Service  
83 Edison Drive  
Augusta, Maine 04336

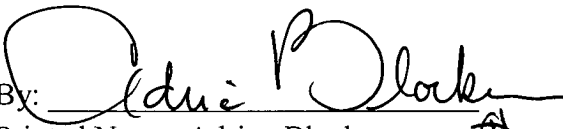
31. **Governing Law; Venue.** This Agreement shall be governed by, and construed in accordance with, the laws of the State of Maine. In addition, the Parties agree that in the event of any dispute concerning this Agreement, venue for any cause of action arising out of, or having to do with, this Agreement shall be, and is, in State or Federal Court in the county in which the Weyerhaeuser Property is located.

[Signatures and notary acknowledgments appear on the following pages]

IN WITNESS WHEREOF, this Agreement is executed on the date of the acknowledgment below but shall be effective for all purposes as of the Effective Date.



**WEYERHAEUSER COMPANY**

By:   
Printed Name: Adrian Blocker

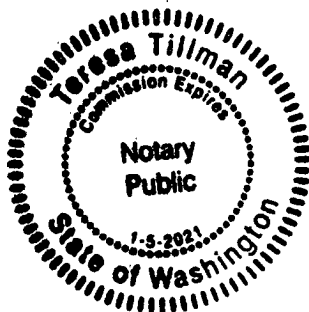
Title: Senior Vice President

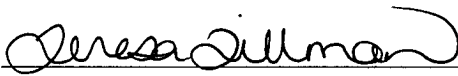
STATE OF WASHINGTON )

COUNTY OF KING )

On this 15<sup>th</sup> day of January, 2019, before me personally appeared Adrian Blocker to me known to be the Senior Vice President, of **WEYERHAEUSER COMPANY**, the corporation that executed the within and foregoing instrument, and acknowledged said instrument to be the free and voluntary act and deed of said corporation, for the uses and purposes therein mentioned, and on oath stated that s/he is authorized to execute said instrument and that the seal affixed is the corporate seal of said corporation.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my official seal the day and year first above mentioned.



  
Notary Public in and for the State of Washington  
Printed Name: Teresa Tillman  
Residing at: King County  
My appointment expires: January 05, 2021

IN WITNESS WHEREOF, this Agreement is executed on the date of the acknowledgment below but shall be effective for all purposes as of the Effective Date.

**Central Maine Power Company:**



Printed Name: Brian Berube

Title: Manager – Avangrid Real Estate Services

STATE OF MAINE

COUNTY OF KENNEBEC

Personally, appeared the above-named Brian Berube, Manager – Avangrid Real Estate Services, in his said capacity and acknowledged the foregoing instrument to be his free act and deed and the free act and deed of CENTRAL MAINE POWER COMPANY.

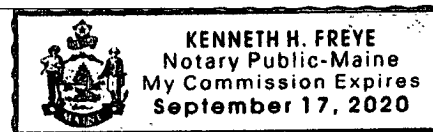
Before me,

Date: December 13, 2018

  
Notary Public

Printed Name

My Commission expires:



SEAL



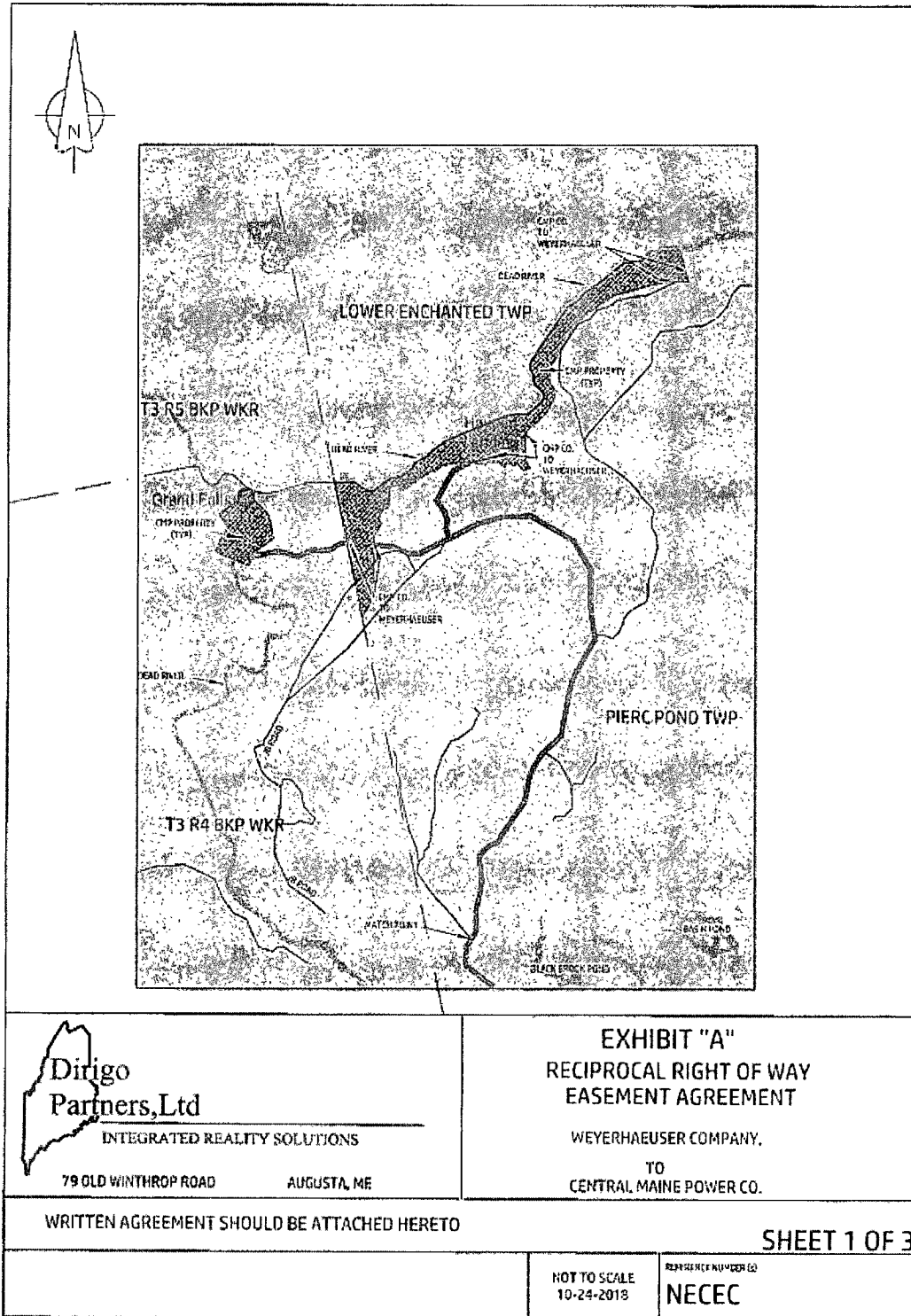
**EXHIBIT A****Weyerhaeuser's Property, Weyerhaeuser' Road and CMP's Easement**

EXHIBIT A: Weyerhaeuser's Property



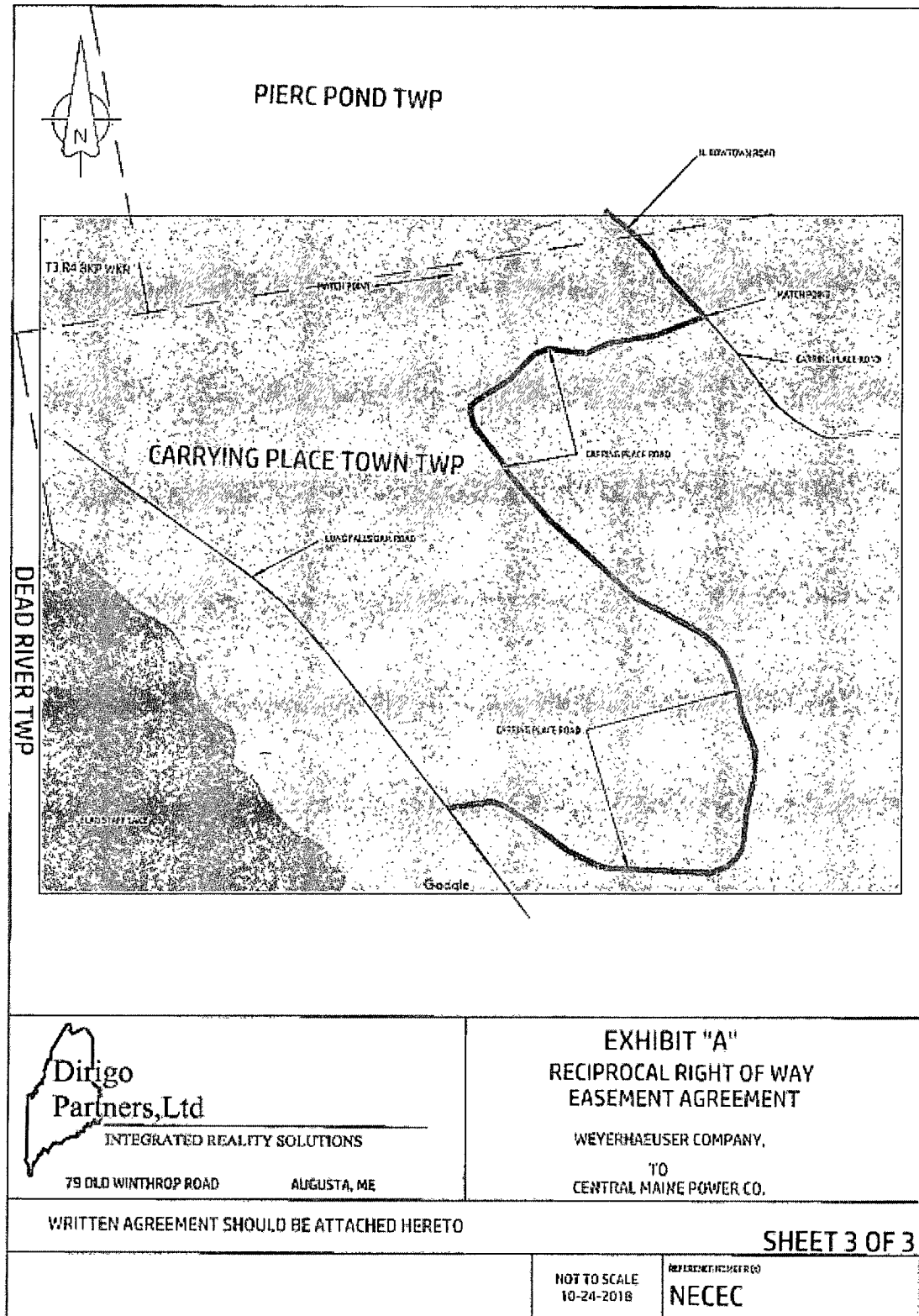


EXHIBIT A: Weyerhaeuser's Property

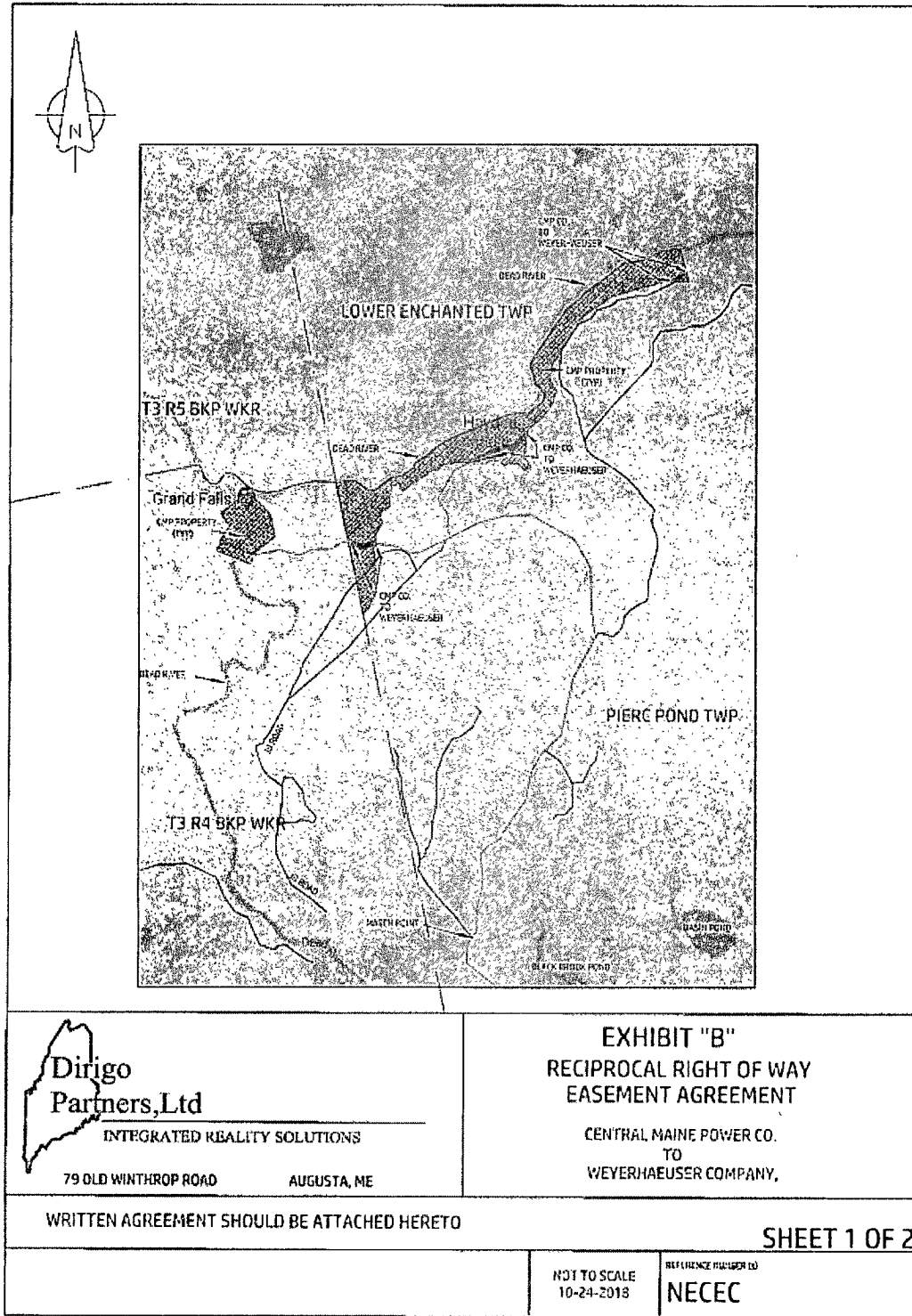
**EXHIBIT B****CMP's Property, CMP's Road and Weyerhaeuser's Easement**

EXHIBIT B: CMP's Property





THIS INDENTURE OF LICENSE made this 19th day of November, 1981 by and between CENTRAL MAINE POWER COMPANY, a Maine corporation having its principal office at Edison Drive, Augusta, Maine 04336 hereinafter sometimes called the "Licensor", and the STATE OF MAINE, by and through its Department of Conservation, having its principal office at Station 19, Augusta, Maine 04333, hereinafter sometimes called the "Licensee".

W I T N E S S E T H

In consideration of the rent and covenants herein contained, the Licensor does hereby grant permission to the Licensee, its agents and invitees, in common with the Licensor and others entitled to use the same, to enter upon and occupy in the manner and subject to the terms, conditions, restrictions and limitations herein contained, the following described premises situated on the northerly side of the Moxie Road in the Township of Moxie, County of Somerset, bounded and described as follows:

1. A certain strip of land being one hundred (100) feet in width, the center of which is located as follows: Commencing at an iron pipe in the northerly line of the Moxie Road, so-called, which iron pipe is one hundred eighty and four tenths (180.4) feet westerly from post numbered seventy-one (71) on the north side of said road and seventy-five and five tenths (75.5) feet northerly from post numbered seventy (70) on the south side of said road. (The above numbered posts were given in back-up deed from Louise H. Coburn, et al to Coburn Lands Trust dated January 15, 1920 and recorded in Somerset County Registry of Deeds, Book 351, Page 564); thence north twenty-three degrees forty-five minutes east (N. 23° 45' E.) four hundred thirteen (413) feet to an iron pipe in the ground; thence north twenty degrees thirty-one minutes west (N. 20° 31' W.) five hundred fifty-nine (559) feet to an iron pipe in the ground; thence continuing in the same course north twenty degrees thirty-one minutes west (N. 20° 31' W.) six hundred eighty-seven and nine tenths (687.9) feet to an iron pipe in the ground; thence north twenty-six degrees forty-four minutes west (N. 26° 44' W.) three hundred seventy-two and six tenths (372.6) feet to an iron pipe set in the ground; thence north forty-eight

degrees twelve minutes west (N.  $48^{\circ} 12'$  W.) one thousand eighty-one and five tenths (1,081.5) feet to an iron pipe set in the ground; thence north forty-eight degrees twelve minutes west (N.  $48^{\circ} 12'$  W.) four hundred seventy-nine and three tenths (479.3) feet to an iron pipe in the ground; thence north eight degrees ten minutes west (N.  $8^{\circ} 10'$  W.) about two hundred eighty-three and five tenths (283.5) feet to the east line of the one thousand (1,000) foot strip of land, so-called, owned by this Licensor and being the same parcel of land delineated on plan numbered Eighteen A (No. 18-A), Plan of Highway Revision from Moxie Road to Site F, East Branch of Kennebec River, dated September 15, 1920, said plan being a revision of Plan Eighteen (18) filed by Fidelity Trust Company, Trust Company, Trustee, December 20, 1919, recorded in Plan Book 6 in the Somerset County Registry of Deeds, and described in paragraph first of the additional descriptions filed and recorded therewith.

Excepting and reserving to the Licensor, its successors and assigns, the perpetual right and easement to pass and repass on foot and with vehicles over, along and across a road as now located on the one hundred (100) foot strip of land to enable the Licensor, its successors and assigns, to obtain access to other land of the Licensor. The cost of maintaining and repairing said road shall be shared equitably, based on use, among the Licensor, the Licensee, and other parties entitled to use the same. Any improvements to the road required by the Licensee shall be subject to the prior approval of the Licensor and shall be made by the the Licensee at its sole expense.

2. Upon foot only upon two certain lots or parcels of land situated on either side of Moxie Stream, each being a strip of land twenty-five (25) feet from the high water line of said stream in its natural condition, bounded and described as follows: Beginning at the easterly line of the said one thousand (1,000) foot strip at a point twenty-five (25) feet northerly measured at right angles from the high water mark on the northerly side of Moxie Stream; thence easterly, southerly and north-easterly parallel with the said high water mark and distant twenty-five (25) feet therefrom to the northeasterly line of land of the Licensee; thence



southerly along the northeasterly line of land of the Licensee crossing said Moxie Stream to a point on the southerly side of said stream twenty-five (25) feet distant southerly at right angles from said high water mark; thence southwesterly, northwesterly and westerly parallel with the high water mark on the southerly side of said stream and distant twenty-five (25) feet therefrom to the easterly line of said one thousand (1,000) foot strip; thence northerly crossing the said Moxie Stream on the said one thousand (1,000) foot strip to the point of beginning.

Excepting and reserving to the Licensor any right, title and interest it may have below the high water line of Moxie Stream.

3. Also granting to the Licensee the right to construct foot trails on the said one thousand (1,000) foot strip bounded on the south by the northerly line of the public lot and on the north by the southerly side of Moxie Stream. The location, clearing, trimming and maintenance of said foot trails to be subject to mutual agreement of the Licensor and Licensee and subject to regulations of the Maine Land Use Regulation Commission and all other applicable authorities.

Also excepting and reserving to the Licensor, its successors and assigns, the perpetual right and easement to overflow and flood any or all of the above-described premises directly or indirectly by backflow, seepage, erosion, inundation or otherwise as the same may be overflowed and flooded by means of any dam or dams that may be constructed now or hereafter and maintained across the Kennebec River or any of its tributaries, including without limitation Moxie Stream. In addition, the Licensor, its successors and assigns, shall not be held liable to the Licensee for the uneven handling of the waters of Moxie Stream.

Also excepting and reserving to the Licensor, its successors and assigns, the right to require the owner or owners of standing timber on all or any portion of the above-described premises within the limits of the one thousand (1,000) foot strip of land, so-called, to remove, at the sole cost and expense of said owner or



owners, said standing timber from such portions of the premises as are to be used by the Licensor, its successors and assigns, for construction purposes, within three (3) months from the date of notice to remove said timber, and from the remainder of said premises within one (1) year from the date of notice to remove said timber.

Yielding and paying therefor the sum of one dollar (\$1.00) payable on the date of the execution of this Indenture.

In consideration of the mutual covenants and agreements herein contained to be kept and performed by the parties hereto, it is agreed as follows:

(1) The Licensee will quit and deliver up the premises to the Licensor, or its attorney, peaceably and quietly at the termination of this license in as good order and condition (reasonable use and wearing thereof or inevitable accident excepted) as the same are now or may be put into by the Licensor or Licensee and will not make or suffer any strip or waste thereof nor assign or underlet the premises or any part thereof or erect any building or structure on the premises without the written consent of the Licensor. The Licensee will post the premises to prohibit camping and the building of fires.

(2) This License is granted on the express condition that the Licensee will purchase and keep in full force and effect general public liability insurance, with minimum coverage of \$500,000 for each occurrence, to protect the Licensor from any liability incurred as a result of the herein described premises as a public recreation area, excepting, however, liabilities incurred as a result of willful acts or negligence of the Licensor.

(3) The Licensor shall not be liable for any personal injuries or property damage suffered by the Licensee, its successors or assigns, agents, employees, independent contractors or invitees, while using above-described property.

(4) This License may be terminated and cancelled at the sole discretion of either party at any time by either party giving to the other party one year's notice in writing of the intent to cancel and terminate this license.

(5) All notices shall be deemed sufficient if sent by mail, postage prepaid to the Licensor at Edison Drive, Augusta, Maine 04336, and to the Licensee at State House Station 19, Augusta, Maine 04333.

(6) This License shall be binding upon and inure to the benefit of the parties hereto, their respective successors and assigns.

IN WITNESS WHEREOF, the said Central Maine Power Company has caused its corporate name to be signed and its corporate seal affixed by Matthew Hunter, its Vice President hereunto duly authorized, and the said State of Maine, has hereunto set its hand and seal, all as of the day and year first above written.

Signed, Sealed and Delivered  
in presence of

CENTRAL MAINE POWER COMPANY

J. Robert Curtis

By: M. Hunter  
Vice President

STATE OF MAINE

Hubert Hartman

By: Hubert Hartman

Approved as to form:  
Paul G. [Signature] 11/14/81

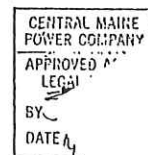




Table 1-5.12 Compensation for Conversion in Roaring Brook Mayfly and Northern Spring Salamander Conservation Management Areas

| Township        | County   | Stream Name                        | Feature ID      | Surveyed? (Y/N) | Species Present <sup>1</sup> | Clearing Impact within the Management Areas <sup>2</sup> (ac) | Clearing Impact (sq ft) | Assessed Land Value (\$/sq ft) <sup>3</sup> | Resource Multiplier Applied to Fee <sup>4</sup> | Calculated Fee                              |
|-----------------|----------|------------------------------------|-----------------|-----------------|------------------------------|---------------------------------------------------------------|-------------------------|---------------------------------------------|-------------------------------------------------|---------------------------------------------|
| Skinner Twp     | Franklin | S. Branch Moose River              | PSTR-09-11      | Y               | RBM                          | 1.84                                                          | 80,107                  | 0.03                                        | 8                                               | \$19,225.64                                 |
| Skinner Twp     | Franklin | Trib to Bog Brook                  | PSTR-11-01      | Y               | NSS                          | 2.75                                                          | 119,659                 | 0.03                                        | 8                                               | \$28,718.24                                 |
| Appleton Twp    | Somerset | Trib to Bog Brook                  | PSTR-12-07      | Y               | NSS                          | 1.90                                                          | 82,590                  | 0.04                                        | 8                                               | \$26,428.72                                 |
| Appleton Twp    | Somerset | Gold Brook                         | PSTR-15-06      | Y               | RBM/NSS                      |                                                               |                         |                                             |                                                 | n/a, mitigation being proposed <sup>5</sup> |
| Appleton TWP    | Somerset | Trib. to Gold Brook                | PSTR-16-07      | N               | RBM/NSS                      |                                                               |                         |                                             |                                                 |                                             |
| Appleton TWP    | Somerset | Trib. to Gold Brook                | PSTR-16-10      | N               | RBM/NSS                      |                                                               |                         |                                             |                                                 |                                             |
| Appleton TWP    | Somerset | Trib. to Gold Brook                | PSTR-16-15      | N               | RBM/NSS                      |                                                               |                         |                                             |                                                 |                                             |
| Appleton Twp    | Somerset | Baker Stream                       | PSTR-17-07      | Y               | NSS                          | 3.10                                                          | 135,036                 | 0.04                                        | 8                                               | \$43,211.52                                 |
| Appleton Twp    | Somerset | Baker Stream                       | PSTR-17R-04     | Y               | NSS                          |                                                               |                         |                                             |                                                 |                                             |
| Bradstreet TWP  | Somerset | Unnamed Stream                     | PSTR-24-02      | N               | RBM/NSS                      |                                                               |                         |                                             |                                                 |                                             |
| Bradstreet TWP  | Somerset | Trib. to Horse Brook               | PSTR-26-05      | N               | RBM/NSS                      | 1.32                                                          | 57,456                  | 0.04                                        | 16                                              | \$36,771.61                                 |
| Johnson Mtn TWP | Somerset | Mountain Brook                     | PSTR-33-01      | Y               | RBM/NSS                      |                                                               |                         |                                             |                                                 | n/a, mitigation being proposed <sup>5</sup> |
| Johnson Mtn TWP | Somerset | Mountain Brook                     | PSTR-EM-34-01   | Y               | RBM/NSS                      |                                                               |                         |                                             |                                                 |                                             |
| Johnson Mtn TWP | Somerset | Trib to Mountain Brook             | PSTR-EM-34-02   | Y               | RBM/NSS                      |                                                               |                         |                                             |                                                 |                                             |
| Johnson Mtn TWP | Somerset | Trib. To East Branch Salmon Stream | PSTR-38-02      | Y               | NSS                          | 4.30                                                          | 187,308                 | 0.04                                        | 8                                               | \$59,938.56                                 |
| Johnson Mtn TWP | Somerset | Trib. To East Branch Salmon Stream | PSTR-38-06      | Y               | NSS                          |                                                               |                         |                                             |                                                 |                                             |
| Johnson Mtn TWP | Somerset | Trib. To East Branch Salmon Stream | PSTR-38-10      | Y               | NSS                          |                                                               |                         |                                             |                                                 |                                             |
| Johnson Mtn TWP | Somerset | Trib. To East Branch Salmon Stream | PSTR-38-15      | Y               | NSS                          | 1.86                                                          | 80,891                  | 0.04                                        | 8                                               | \$25,885.09                                 |
| Johnson Mtn TWP | Somerset | Trib. to Cold Stream               | PSTR-40-07      | N               | RBM/NSS                      | 4.08                                                          | 177,855                 | 0.04                                        | 16                                              | \$113,827.51                                |
| Johnson Mtn TWP | Somerset | Trib. to Cold Stream               | PSTR-41-04      | N               | RBM/NSS                      |                                                               |                         |                                             |                                                 |                                             |
| Bradstreet TWP  | Somerset | Trib to Piel Brook                 | PSTR-SRD1-02    | N               | RBM/NSS                      |                                                               |                         |                                             |                                                 |                                             |
| Bradstreet TWP  | Somerset | Unnamed Stream                     | PSTR-SRD1-28-02 | N               | RBM/NSS                      | 1.48                                                          | 64,599                  | 0.04                                        | 16                                              | \$41,343.67                                 |
| Bradstreet TWP  | Somerset | Unnamed Stream                     | PSTR-SRD1-28-05 | N               | RBM/NSS                      | 1.48                                                          | 64,599                  | 0.04                                        | 16                                              | \$41,343.67                                 |
| Total Impact    |          |                                    |                 |                 |                              |                                                               | 26.416 Acres            | 1,150,681 Sq. ft.                           | Total Fee                                       | \$469,771.95                                |

<sup>1</sup> For those streams outside of CMP's ownership and on lands which permission to survey was not granted from landowners, and unless the waterbody is hydrologically connected to another stream which presence/absence surveys were conducted, the presence of both species is assumed.

<sup>2</sup> The clearing impact includes the area extending 250 feet on both sides of the stream channel. The management areas were mapped according to "Notes on Mapping Protocol for Roaring Brook Mayfly Habitat Polygons in ETSC (12/22/10)" provided by MDIFW. This mapping protocol was applied to RBB and NSS waterbodies, as recommended by MDIFW. Where mapped management area polygons overlapped, the impact area was combined.

<sup>3</sup> Source: MDEP Fact Sheet- In Lieu Fee Compensation Program (rev 2017).

<sup>4</sup> On 11/8/2018, MDIFW recommended a resource multiplier of 8 be applied to the fee calculation for each species present, where both species are present a multiplier of 16 was applied.

<sup>5</sup> CMP will retain full height vegetation in the CMA's for these resources.





STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED REBUTTAL TESTIMONY AND EXHIBITS OF  
AMY SEGAL

March 25, 2019

Regarding

- Issue 1: Scenic Character and Existing Uses – I. Project Visibility
  - Responsive to Intervenor Group 2 witness Elizabeth Caruso
  - Responsive to Intervenor Group 10 witness Noah Hale
- Issue 1: Scenic Character and Existing Uses – II. Old Canada Road Scenic Byway
  - Responsive to Intervenor Group 1 witness Roger Haynes
- Issue 1: Scenic Character and Existing Uses – III. Effect on Appalachian Trail
  - Responsive to Intervenor Group 4 witness David Publicover
- Issue 1: Scenic Character and Existing Uses – IV. Effect on Kennebec River
  - Responsive to Intervenor Group 2 witness Greg Caruso

- Responsive to Intervenor Group 10 witnesses Eric Sherman and Edwin Buzzell
- Issue 1: Scenic Character and Existing Uses – V. Effect on Other Scenic Resources
  - Responsive to Intervenor Group 10 witnesses Eric Sherman and Edwin Buzzell
  - Responsive to Intervenor Group 2 witness Elizabeth Caruso
  - Responsive to Intervenor Group 1 witness Robert Haynes
- Issue 1: Scenic Character and Existing Uses – VI. Evaluation of Scenic Resources
  - Responsive to Intervenor Group 2 witness Elizabeth Caruso
- Issue 1: Scenic Character and Existing Uses – VII. Winter Recreation Survey
  - Responsive to Intervenor Group 2 witness Elizabeth Caruso
- Issue 1: Scenic Character and Existing Uses – VIII. Market Decisions Survey
  - Responsive to Intervenor Group 2 witness Elizabeth Caruso
- Issue 1: Scenic Character and Existing Uses – IX. Structure Lighting
  - Responsive to Intervenor Group 2 witnesses Elizabeth Caruso and Greg Caruso
  - Responsive to Intervenor Group 10 witness Noah Hale
- Issue 1: Scenic Character and Existing Uses – X. Elevated Viewpoints
  - Responsive to Intervenor Group 2 witness Roger Merchant
- Issue 1: Scenic Character and Existing Uses – XI. Effect on Use
  - Responsive to Intervenor Group 10 witness Kathy Barkley

**I. Issue 1: Scenic Character and Existing Uses – Project Visibility  
(Relevant to DEP and LUPC Review)**

The testimony of Kathy Barkley (p. 1, lines 12-22) is representative of the hyperbolic sentiment that the Project will be highly visible throughout northwestern Maine: *“The corridor created by NECEC will forever destroy the northwestern Maine scenic views tourists and locals alike value and enjoy. No amount of buffering or pole color or design can change the fact that in a forested or natural area this corridor will be an eyesore. No one travels Route 201 and our access roads to view a powerline with poles higher than most trees and 150-foot corridor that scars the landscape.*

The testimony of Roger Merchant includes a similar narrative in his Comments on Non-Hearing Topics (p. 13): *“CMP’s line will chop up a vast and beautiful forest*

*landscape, eroding and degrading remote scenic viewsheds like Attean View, Coburn and Sally Mountains, Greenlaw Cliffs, The Notch, No. 5 and Tumbledown, all in the Upper Moose River Basin. There will be similar impacts at the Kennebec Gorge and Lake Moxie, adjacent to Bald Mountain and the Appalachian Trail.”*

## **Response**

**1. Transmission Structure Color.** As seen in the photosimulations prepared to support the VIA, the use of self-weathering steel monopoles, which will weather to a dark brown color over time, is an effective mitigation measure when used in a wooded landscape, especially when the Project may be seen from elevated viewpoints.

**2. Views from Route 201 (Relevant to DEP Review Only).** While the transmission corridor may be visible to varying degrees at five locations along the Old Canada Road Scenic Byway (Route 201), motorists will cross the 150-foot corridor at only two locations (i.e., Johnson Mountain Twp. and Moscow), separated by approximately 30 miles (or 40 minutes driving time). The crossings occur in areas that are either recently harvested or that contain existing transmission lines; neither location epitomizes the scenic views that draw people to the area. Views points like the Attean View Rest Area will be minimally affected, due to the effect of distance, vegetative patterns, and the use of self-weathering steel monopole structures.

**3. Views from Access Roads.** Describing private timber roads as “our roads” and the commercial timberlands as “our forests” and “our hills” shows a lack of understanding about the nature of property ownership and land management activity that surrounds the Project. We recognize the long tradition of public access, which allows recreational use on working timberlands. However, the majority of the road crossings are



on private property and do not constitute the type of public viewpoints that are regulated by the state.

See, for example, the testimony of Group 5 witness Mike Novello, who states that Wagner Forest Management does not want DEP or LUPC to consider “views from any private land or private roads in evaluating whether or not the CMP project will have an adverse effect on scenic character.” This testimony demonstrates that any impact from these lands cannot be considered to be unreasonable if the landowner is not concerned about such an impact. See also the February 21, 2019 letter to DEP from Christopher Fife of Weyerhaeuser, which owns much of the land described in Mr. Merchant’s comments. In any case, our photosimulations show that the effect on the Project’s surrounding area will not be unreasonable.

## **II. Issue 1: Scenic Character and Existing Uses – Effect On Old Canada Road Scenic Byway (Relevant to DEP Review)**

Robert Haynes, Coordinator, Old Canada Road Scenic Byway (OCR), notes that Chapter 315 regulations define several categories of scenic resources that must be considered in a VIA. He highlights four of these categories, and includes some resources in each of these categories where he apparently believes there may be views of the Project (see response to V. Effect on Other Scenic Resources, below). In his conclusion, Mr. Haynes states that *“It is evident to OCR that CMP has not made sufficient effort to allow the construction to blend into the existing natural environment or shown that the towers wouldn’t negatively affect existing uses and scenic character.”* Mr. Haynes states that *“OCR asserts that CMP has made no effort to minimize project effects within sight of OCR or any of the scenic land-marks along the Spencer Road...”*

**Response.** The Project will be visible from OCR Scenic Byway in only five locations over a distance of 30 miles: a) Johnson Mtn Twp, where it crosses the Byway, b) a 1,000-foot section in Parlin Pond Twp, c) the Attean View Rest Area, d) a second crossing near Wyman Dam in Moscow, and e) filtered views from Bingham.

Many steps were taken to site the Project to minimize visibility and potential impact to the 49-mile segment of the Byway that is within the study area. First, the initial layout for the transmission line was purposely designed to avoid visual impacts to the lakes, ponds, scenic vistas, and historic sites that characterize the OCR Byway. Second, CMP determined that the use of self-weathering steel monopoles would result in the least amount of color contrast where the line may be visible. Third, the two locations where the Project crosses the Byway are in areas that are at or near transportation or transmission corridors. Fourth, the crossing in Johnson Mountain Twp is between Weyerhaeuser's Capital Road and Judd Road, and near the existing Jackman Tie Line transmission line corridor intersection with Route 201. Fifth, the crossing in Moscow is within an existing transmission corridor and 2,300 feet north of another crossing with two existing transmission lines.

Motorists on the Byway will encounter the Project for relatively short periods of time; the locations where the Project may be visible are separated by considerable distances. At the Johnson Mountain Twp crossing the Project will be visible for up to 80 seconds for northbound motorists and approximately 30 seconds for southbound traffic traveling at 45 MPH. The two points where the Project crosses the Byway (a new crossing in Johnson Mountain Twp and in the existing transmission corridor in Moscow) are separated by 30 miles.

The Project will not be visible to northbound motorists on the 1,000-foot section of the Byway in Parlin Pond Twp, due to the viewing angle from the road. Southbound motorists will have approximately 15 seconds of filtered views of the transmission line in the midground as it crosses the lower slopes of Colburn Mountain. At the Attean View Rest Area, the Project will be seen at a distance of over 7 miles. The Project will not be apparent to the average observer, due to the effect of distance, existing vegetation patterns, and the minimal contrast produced by the self-weathering steel monopole structures. In Bingham, northbound motorists during leaf-off conditions will have approximately 45 seconds of filtered views of the expanded transmission line at a distance of 0.4 to 0.8 mile.

While the Project will be visible to varying degrees, it is seen in context with commercial forest operations; in no location will it dominate the landscape seen from the road. The presence of the transmission line will not result in an unreasonable adverse visual impact on the Byway.

Spencer Road is a private road owned and maintained by Weyerhaeuser for its use in managing its commercial timberland. It is not a State or federally designated trail. The public has traditionally been allowed to use the road to access nearby ponds and private camps. By definition, it is not a scenic resource. However, CMP has taken many steps to minimize Project effects along Spencer Road: use of elevated structures to cross Gold Brook, and preserving full height vegetation; use of tapered vegetation management adjacent to a section of the road in Appleton Twp. to minimize Project views both from the road and from Rock Pond; aligning the corridor to avoid Project views from the

majority of lakes and ponds near the corridor; and maintaining a setback from Spencer Road wherever possible.

### **III. Issue 1: Scenic Character and Existing Uses – Effect On Appalachian Trail (Relevant to DEP and LUPC Review)**

David Publicover states in his testimony *“The widening of the corridor and the addition of a second transmission line with taller towers would increase the exposure of hikers to the open corridor and intensify the experience of being in a developed rather than backcountry environment. The Applicant’s Visual Impact Assessment (Application Chapter 6 pp. 6-43 to 6-44) rates the impact as “minimal to moderate.” The Applicant also states (Application Chapter 25, Section 25.3.1.3) that there would be a “negligible” change in visual impact. However, these conclusions are contradicted by the revised Chapter 6 Appendix F (Scenic Resources Chart, 1/30/19) that rates the impact as “Moderate/Strong”. The Applicant also states (Application Chapter 6 p. 6-50), “The Project should not negatively affect the hikers’ experience or their continued use and enjoyment of the Appalachian Trail.” The statement that the project will not negatively affect hikers’ experience is made without any supporting evidence, and is contradicted by the revised impact rating of Moderate/Strong and the Applicant’s recognition of the need to mitigate this impact through vegetative screening.”*

**Response.** As northbound hikers descend Pleasant Pond Mountain toward Troutdale Road, they no longer have the experience of being in the backcountry. In its present configuration, hikers encounter the existing 150-foot wide transmission corridor, approximately 900 feet of Troutdale Road, and several residences adjacent to the road. Approximately 450 feet of the trail is located on a section of Troutdale Road that is zoned



D-RS: Residential. Northbound hikers on the road currently see the overhead conductors through the trees lining the road for approximately 91 seconds. With widening of the corridor, hikers will have views of the transmission lines for an additional 16 seconds. Hikers will be in the 225'-wide corridor for 51 seconds. Considering the limited number of places where the Project may be visible between Pleasant Pond Mountain and Bald Mountain (a distance of approximately 7.6 miles), the presence of the existing transmission corridor, and the limited viewing time for a hiker to see the expanded line, the overall visual impact will be minimal to moderate. The apparent rating discrepancy noted by Mr. Publicover is the difference between the assessment of the overall effect that the Project would have on this section of the AT, and the specific experience of hikers at Joe's Hole.

As seen in the photosimulation at Joe's Hole, where the northbound hiker will see the expanded corridor for 16 seconds, the additional clearing will have a moderate-strong visual effect on the view from the trail. Subsequent to filing the initial application and as part of the consideration of potential impacts on the AT, we evaluated various ways to minimize the view of the expanded clearing. The native planting buffer being proposed along the Troutdale Road section of the trail grew out of that discussion, and adequately addresses the effect so that the impact is minimized.

Regarding hiker expectation, The Official Map and Guide to the Appalachian Trail in Maine notes that there are at least two transmission line crossings in the vicinity of Joe's Hole. Hikers are aware of the presence of the line, and the location of the trail on a road. It is unrealistic to assert that an incremental change in the transmission line, resulting in 16 seconds of additional visibility and a widened corridor, will have a

significant effect on trail use patterns or the experience of being on the Appalachian Trail.

#### **IV. Issue 1: Scenic Character and Existing Uses – Effect On Kennebec River (Relevant to DEP and LUPC Review)**

Testimony of Eric Sherman (p. 2, line 22 and p. 3, lines 1-2) states *“I have concerns for the experiences of the guests who book raft trips on the Kennebec River,...”* And he states further (page 6, lines 5-17) that *“The company I’ve worked for since 2001, Moxie Outdoors Adventure, has a lunch site just upstream of where the proposed lines will cross either over or under the river. In either scenario, those lines will be visible from our lunch site, and will be an eyesore that detracts from the wilderness experience of my guests, the other guests, the other guides, and me.”*

Eric Sherman (page 6, line 22, page 7, line 3) states, *“The other river view of the power lines that CMP/Avangrid/Iberdrola has not addressed are from downriver looking back upriver. Once the lines are passed, there’s a left turn in the river, a straight stretch where the confluence of Moxie Stream is passed, then a right turn in the river, and a long straight stretch from which the power lines will be able to be seen.”*

Edwin Buzzell (page 4, line 23, page 5, line 1) states, *“Cutting to the river’s edge will destroy the natural wonder on a particularly scenic section of the [Kennebec] river.”*

Greg Caruso (page 3, lines 7-8, page 5, line 1-2, page 7, lines 9-10) states, *“There has never been anyone that said... ‘We need some red balls hanging over this awesome gorge!.’”*; *“CMP’s proposed project will likely have significant negative impacts on existing whitewater rafting,..”*; *“The project will cross and degrade the scenically and recreationally significant Kennebec Gorge.”*

**Response.** CMP has proposed to use horizontal directional drilling (HDD) to locate the Project underground below the upper Kennebec River to eliminate visual impact from the river. The NECEC will not cross over the upper Kennebec River. CMP's design of the HDD crossing of the Kennebec River was presented in the NECEC Kennebec River HDD Site Law and NRPA Application Amendments, submitted on October 19, 2018 in response to the September 4, 2018 MDEP/LUPC Information Request.

The termination stations will be set back from the edge of the river by approximately 1,400 and 1,440 feet. The termination stations and the transmission structures leading to the stations on either side of the river will not be visible from the river due to the existing riparian vegetation and the preserved forested buffer within the NECEC corridor on both sides of the river. The preserved vegetated buffers (1,450 feet and 1,160 feet on the east and west sides of the river, respectively), which average 75 feet in height, will screen views of the termination stations and all other HDD components from users on the river.

The Moxie Outdoors Adventure picnic area on the Kennebec River is located northeast of the Project corridor. CMP completed an assessment of termination station visibility and found that the existing forest buffer will screen the stations and all other HDD components from the picnic area.

All of the lunch sites in the Kennebec Gorge and related river areas are owned by CMP, which allows the commercial rafting outfitters and general public to use the sites without charge. The "our lunch site" characterization incorrectly implies an ownership

right that does not exist. CMP would allow Moxie Outdoors Adventure, or any other outfitter, to use one of the vacant sites if it wanted to do so.

**V. Issue 1: Scenic Character and Existing Uses – Effect on Other Scenic Resources (Relevant to DEP and LUPC Review)**

**a. No. 5 Mountain And Williams Mountain**

Eric Sherman (page 2, lines 14-19), states that *“The Project will be visible from Williams Mountain and Number 5 Mountains. Should the NECEC be approved, these are just two of the dozens of negative visual impacts it will cause.”* Mr. Sherman states (page 4, lines 1-5) that *“Number Five Mountain top views- Will affect me as will others as a detriment to the Natural Scenic Beauty. The Transmission Corridor would deter me from climbing No. 5 Mountain as I have many times in the past. I would not recommend the hike to others if the proposed corridor was built. It would destroy the natural element that makes No 5 Mountain a special place.”*

**Response.** CMP included an assessment of potential visual impact to No. 5 Mountain within the Leuthold Preserve, owned by The Nature Conservancy. The closest visible portion of the Project corridor will be 3.9 miles from the summit. As seen in Photosimulation 4, the corridor clearing will be intermittently visible from the summit and will result in a minimal visual impact to hikers. The transmission structures will not be visible to the casual observer due to the effect of distance and the use of self-weathering steel, which will minimize their color contrast with the surrounding commercial forestland.

Williams Mountain is located 6.4 miles northeast of the Project within the Moosehead Region Conservation Easement in Misery Twp, outside the 5-mile Area of



Potential Effect (APE) for elevated viewpoints that was approved by the MDEP. The Maine Bureau of Parks and Lands developed a new trail to the abandoned fire tower on Williams Mountain in July 2017. The primary views appear to be toward the south, toward Cold Stream Pond. At a distance of 6.4 miles, the Project corridor will be minimally noticeable and will not result in an adverse visual impact.

**b. Rock Pond**

Edwin Buzzell (page 4, lines 6-8) states that “*Rock Pond – Will affect me as I would not fish at or near Rock Pond as views of the transmission line would affect the existing scenic views.*”

**Response.** CMP has proposed three mitigation measures to reduce the visual impacts to Rock Pond:

- 1) Self-weathering steel structures to minimize contrast with the wooded background,
- 2) Non-specular conductors to reduce the glare from the conductors when viewed from the pond, and
- 3) Tapered vegetation management for the section of the corridor on the shoulder of Tumbledown Mountain, to reduce the appearance of the cleared corridor when viewed from the pond.

While portions of the Project may be visible, the presence of the line will not unreasonably interfere with the general public’s ability to fish, hike, snowmobile, or enjoy other scenic or aesthetic uses on Rock Pond.

**c. Moxie Stream**

Edwin Buzzell (page 5, lines 2-5) states, “ *I travel there [Moxie Stream] on a regular basis and I recommend to my guests to travel to almost the exact spot of the proposed transmission line crossing and hike down to Moxie Falls. Many other waterfalls exist between the crossing points and Moxie Falls. (See Exhibits 3A through 3D)*”

**Response.** The Project crosses Moxie Stream approximately 500 feet west of the former Fish Pond Road bridge. The “exact spot” that Mr. Buzzell is referring to is owned by CMP (the 80-acre Lower Dam Lot). All the land along Moxie Stream (25 feet, both sides) is also owned by CMP. The hike down to Moxie Falls that Mr. Buzzell refers to is across 1.25 miles of other private land. While the bridge over Moxie Stream is gone (only the rip-rap remains), the site is still accessible by car over the road. The Project was sited in this location to specifically avoid impacts to the waterfalls on Moxie Stream.

**d. Coburn Mountain**

Edwin Buzzell (page 5, lines 9-11) states, “*View from own home – I have a direct view of Coburn Mountain from my home in Moxie Gore. At about 1,300 feet I will be able to witness the destruction of my view from my own house.*”

Elizabeth Caruso (page 5, lines 15-17) states that “*On a busy day, hundreds of tourists snowmobiling to Coburn Mountain’s 3800’ observatory would be staring 360 degrees down at the vastness of this destructive corridor.*”

Elizabeth Caruso (page 14, lines 21-24) also states that “*Coburn Mountain, with its 360-degree spectacular view, is the major lure of snowmobile riders from Eustis,*

*Jackman, Greenville and Bingham. Wrapping industrial infrastructure all around Johnson and Coburn mountains will turn away these riders.*

**Response.** The view from the Coburn Mountain Public Land is an example of how CMP has responded to potential visual impacts. While the view from Coburn Mountain is a tapestry of natural and man-made patterns, the proposed transmission corridor would create a new line noticeable in the mid-ground viewing distance, especially during winter months. As a mitigation measure, CMP is proposing tapered vegetation management to reduce the contrast between the corridor and the surrounding commercial forest land.

This approach is illustrated with a wintertime photosimulation that shows how tapering vegetation would effectively narrow the visual presence of the line. The transmission structures and conductors will not be highly visible due to the distance involved and the use of self-weathering steel structures, and the impact will not be unreasonable.

The photographs of Coburn Mountain taken from the Buzzell home in West Forks show a patchwork pattern of commercial timberland on the shoulder of Coburn Mountain where the Project will be located. The photographs appear to be taken with a telephoto lens that greatly enlarges the mountain views beyond what a person normally experiences. The Buzzell home appears to be over 12 miles from Coburn Mountain and will have a minimal view of the Project.

The Project will not wrap around Johnson and Coburn mountains, nor will it be visible for 360 degrees from Coburn Mountain, as claimed by Elizabeth Caruso. The closest and most visible portion of the Project will be one to three miles from the summit

and seen over approximately 24 degrees (or 6.6%) of the 360-degree view to the southeast. To minimize potential visual impacts, this section of the transmission corridor will employ tapered vegetation management to reduce the visual prominence of the corridor, as shown in Photosimulation 44, dated January 8, 2019. The remainder of the Project view to the southeast (between 3 and 5 miles) will be screened by Johnson Mountain.

While there will be some Project visibility in other directions from the summit, the views are mostly perpendicular to the viewer's direction and located at distances greater than 2.5 miles. If the corridor is visible at all, it will be seen as an intermittent line moving through the landscape, visually interrupted by vegetation, clear cuts, and topography. The dark brown self-weathering steel structures will blend with the vegetation patterns that characterize the surrounding commercial forestland. See Exhibit CMP-5.1-A, which shows where the Project will be blocked by topography and where it will be visible in the midground (1 to 3 miles), where tapered vegetation management will be used in the midground, and where the Project will be minimally visible in the background (> 3 miles from the summit).

While portions of the Project will be visible from Coburn Mountain, the presence of the line will not unreasonably interfere with the general public's ability to snowmobile or enjoy other scenic or aesthetic uses on the Coburn Mountain Public Land.

**e. #5 Bog**

Mr. Haynes lists the #5 Bog as an example of an outstanding natural or cultural feature.

**Response.** The open water of No. 5 Bog is approximately 3.2 miles north of the



Project. Public access to the bog is limited to private roads off the Attean to Holeb Portage Trail. While viewshed analysis indicates the Project may be visible from the Bog, field work indicates Project visibility will be extremely limited from within the Bog due to the shoreline vegetation and viewing distance, and will not result in an unreasonable adverse visual impact.

**f. ITS snowmobile trails**

Mr. Haynes lists ITS snowmobile trails as an example of a State or federally designated trail.

**Response.** Most of the ITS snowmobile trails with views of the Project are on private lands, and therefore are not considered scenic resources. As noted above, both Wagner and Weyerhaeuser have stated that they are not concerned about the Project's potential scenic impacts to the surrounding lands they own and manage.

**g. Spencer Lake Prisoner of War Camp**

Mr. Haynes identifies this site as a property on or eligible for inclusion on the National Registry.

**Response.** The site is not on or eligible for inclusion on the National Register of Historic Places. The Spencer Lake Prisoner of War Camp is the site of the WWII POW Camp, approximately 1.3 miles south of the Project, on the south side of Spencer Road east of Chubb Pond in Hobbstown Twp. None of the 22 buildings that comprised the camp remains. The site today serves as a small auto-accessible campsite. The transmission line will not have any visual impact on the site.

#### **h. Moore Pond Public Land**

Mr. Haynes includes the Moore Pond Public Land as an example of a public land visited by the general public in part for the use, observation, enjoyment, and appreciation of natural or cultural visual qualities.

**Response.** This 180-acre parcel, known as Bradstreet Township South Lot, encompasses most of 47-acre Moore Pond. The Upper Kennebec Region Management Plan (Department of Agriculture, Conservation and Forestry, Bureau of Parks and Lands, 2018) indicates that a few boats are stored at the southern shoreline (the pond is rated as significant for its fishery resource). Fieldwork and cross section analysis confirmed that there will be no view of the Project from Moore Pond due to intervening vegetation.

#### **i. Number Five Mountain Trail**

Mr. Haynes includes the Number Five Mountain Trail as an example of a public natural resource or public land visited by the general public in part for the use, observation, enjoyment, and appreciation of natural or cultural visual qualities.

**Response.** Number Five Mountain is in the Leuthold Preserve, which is managed collaboratively by The Nature Conservancy, Forest Society of Maine, and the Maine Bureau of Parks and Lands as an ecological reserve. As seen in Photosimulation 4, the transmission corridor will be noticeable from the summit of No. 5 Mountain at a closest distance of 3.9 miles. The self-weathering steel monopoles will be difficult to see against the wooded background of the commercial forest land due to their dark brown color.

The summit is fairly open with several large areas of exposed ledge with 360-degree views of the surrounding area. An old fire tower on the summit of No. 5 Mountain allows hikers to gain a view above the tree line, but since there is no

observation deck on the tower the views are from the tower stairs. The view of the Project from the summit of No. 5 Mountain is partially screened by No. 6 Mountain.

**VI. Issue 1: Scenic Character and Existing Uses – Evaluation of Scenic Resources (Relevant to DEP and LUPC Review)**

Elizabeth Caruso (page 9, lines 11-15) states that *“The peer reviewer said, The question remains – why is there not a full accounting of potential scenic resources and a documented evaluation of all those with potential visibility? There does not even appear to be a process to attempt a full accounting.”*

**Response.** CMP has submitted a full accounting of the process of evaluating all scenic resources within the Study Area of the Project. CMP’s October 19, 2018 response to the September 4, 2018 MDEP/LUPC Information Request included Attachment G, which presented the following:

- 1) A methodology for evaluating potential impacts to road crossings and a table summarizing the results of the evaluation (Road Buffer Evaluation Summary);
- 2) A rationale for scenic resource / photosimulation selection; and
- 3) Scenic Impact Rating forms for photosimulations (completed on August 10, 2018 for leaf-on; January 30, 2019 for leaf-off snow cover).

CMP’s December 7, 2018 Response to the November 5, 2018 Additional Information Request also included Attachment F, which contains the following:

- 1) An updated Summary of Scenic Resources Chart, a 22-page summary of all scenic resources, and the process we used to evaluate these scenic resources (updated January 30, 2019);

2) A Summary of eligible structures identified by SEARCH for inclusion on the National Register of Historic Places; and

3) A description of roads with scenic quality and cultural character.

CMP's December 7, 2018 Response to the November 5, 2018 Additional Information Request, also included Attachment E, which describes the following:

- 1) Potential impacts to recreational users; and
- 2) An evaluation of river and stream visibility (updated January 11, 2019).

**VII. Issue 1: Scenic Character and Existing Uses – Winter Recreation Use Survey (Relevant to DEP and LUPC Review)**

Elizabeth Caruso (starting on p. 5, line 18) describes a “Winter Recreation Impact Survey” that was conducted by Sandra Howard. Ms. Caruso states: *“We are sure that, had the applicant conducted an analysis of the snowmobile recreation users of the area of the new corridor, the data would show an overwhelming opposition to industrialized infrastructure in this scenic area. As guides and guests have attested, 100’ poles, red blinking lights and 150-300’ scars across the mountains, valleys, streams and ponds are simply horrific to recreationists and tourists traveling to encounter a natural setting.”*

**Response.** The results of the Howard survey provided by Ms. Caruso do not include any methodology to indicate how it was formulated, tested, administered, or evaluated. It is our understanding that the survey was distributed through social media channels, specifically to people who visit Facebook sites that are run by groups opposed to the Project. Thus there is a built-in bias on the part of the respondents who may have seen the survey as a way to register their opposition to the Project. While the survey may accurately represent the views of those 163 individuals who took the survey, there is no



way of telling if it is representative of the general population as a whole. Contrary to Ms. Caruso's assumptions about widespread opposition by snowmobilers, the Maine Snowmobile Association supports the NECEC Project.

The Howard survey asked respondents to "look at the scenic photos and GIS simulation photos that show a 150-wide cleared corridor with 100-foot transmission towers." The images used in the survey are not photographs; the "GIS simulation photos" are actually screen shots from Google Earth, with a computer-generated model of a transmission line superimposed. The images used in the survey are not photosimulations. The yellow color seen in the images is used to make the edges of the transmission corridor legible; in most instances, especially at distances greater than 3 miles, the corridor will be seen as a subtle change in vegetation color and minimally noticeable.

Ms. Caruso makes reference to "red blinking lights and 150-300' scars across the mountains, valleys, streams, and ponds..." As noted elsewhere, aviation warning lights will not be required for the Project (with the possible exception of a section near the Bowman Airfield in Livermore). In the northern section containing new line, the Project will be sited in a cleared corridor 150 feet in width, not 300 feet as stated by Ms. Caruso.

Professionally developed intercept surveys (such as the one used by CMP to evaluate the effect of an overhead transmission line on the upper Kennebec River) rely upon accurate photosimulations to test respondents' reactions to potential changes in the visual landscape. The images used in the Howard survey show a highly exaggerated view of the Project and are not representative of the actual visual effect that the Project would have.

Some of the questions in the Howard survey show an inherent bias against the Project. For example “What visual impact would a 150-foot wide cleared corridor with 90-foot transmission towers have on your wilderness snowmobile experience?” It is unclear whether the respondents are meant to answer this question after having viewed the photographs and Google Earth images from Coburn Mountain, or whether this is a hypothetical question that would put motorized vehicles in a wilderness setting. If the question is meant to elicit comments about Coburn Mountain, it is very obvious from the images in the survey that the surrounding area is commercial forest land, with ample evidence of intensive management activities. If the question is meant to probe a snowmobiler’s experience, the term ‘wilderness’ is misleading. Wilderness is generally assumed to be land that is maintained essentially in its natural state, without the introduction of roads, buildings, motorized vehicles (like snowmobiles), and other intrusive elements. Maine has two designated Wilderness Areas; snowmobiling is prohibited in all congressionally designated wilderness areas.

#### **VIII. Issue 1: Scenic Character and Existing Uses – Market Decisions Survey (Relevant to DEP and LUPC Review)**

In Exhibit 5 of Elizabeth Caruso’s testimony, she asked the following rhetorical question (superimposed on a page from the Market Decisions’ Kennebec River Rafting Experience Survey): *“The majority of respondents said that power lines on hillsides would be negative. How will this impact their decision to return to this area for a wilderness experience in the future?”*

**Response.** Respondents to the Market Decisions’ survey were asked to rate the impact of various types of human activity that may be seen from rivers in Maine. The

respondents rated views of industrial facilities, views of parking lots, and views of power lines as having the largest negative impact on their potential experience on the river.

Views of motorized boats and residential development were also seen in a negative light.

Ms. Caruso's question (ignoring the mischaracterization of the rafting trip as a 'wilderness experience') is addressed in the analysis of survey questions 13 and 15: *After reviewing the images in the survey, respondents were still likely to indicate they would enjoy the rafting trip (rating 5.8 on the 7 point scale) and would be likely to return to raft in the future (rating their likelihood as 6 on the 7 point scale). While the respondents that saw the image of the powerlines rated the scenic value much lower than the group that did not see the powerlines, they were just slightly less likely to indicate they would enjoy the rafting trip and return in the future after seeing the images.*

In any case, CMP has proposed to construct the Project beneath the upper Kennebec River, so no portion of the Project will be visible from that location. Other Kennebec River crossings will be co-located with existing transmission lines.

**IX. Issue 1: Scenic Character and Existing Uses – Structure Lighting (Relevant to DEP and LUPC Review)**

Several of the interveners expressed concern about impacts from lighting that they believe would be associated with the Project. See Testimony of Elizabeth Caruso: p. 3, line 20; p. 5, line 28. See Testimony of Noah Hale: p. 2, line 15. See Testimony of Greg Caruso: p. 3, line 6; p. 10, lines 16-19.

**Response.** Since none of the proposed transmission structures associated with the Project will exceed 200 feet in height, the Federal Aviation Administration will not require aviation hazard lighting. (FAA Advisory Circular No. 70/7460-1L, dated

12.04.15.) The only part of the Project that may require aviation hazard lighting is in the vicinity of Bowman Airfield in Livermore where, due to proximity to the airfield, the existing transmission line near the landing strip already has FAA lighting and marker balls in compliance with FAA regulations.

**X. Issue 1: Scenic Character and Existing Uses – Elevated Viewpoints (Relevant to DEP and LUPC Review)**

In Mr. Merchant’s Comments on Non-Hearing Topics, he states: “*CMP photo-simulations tend to focus on lower elevation lakeside views that minimize the visual impact. These photos speak directly to the viewshed impacts that the NECEC project will have from multiple viewpoints within the Upper Moose River Basin.*”

**Response.** The VIA illustrates the effect the Project will have on characteristic landscapes throughout the study area. Of the 33 photosimulations that were provided with the initial VIA, 8 were from elevated viewpoints (e.g., Bald Mountain, Pleasant Pond Mountain, Mosquito Mountain, Coburn Mountain, No. 5 Mountain, and Attean Rest Area). They are representative and do not minimize the visual impact of the Project.

**XI. Issue 1: Scenic Character and Existing Uses – Effect On Use (Relevant to DEP and LUPC Review)**

Kathy Barkley notes in her testimony (p. 1, lines 12-22) that “*The proposed NECEC corridor will negatively affect the existing uses of every area of northwestern Maine it runs through. Hikers, hunters, fisherman, photographers, campers, non-motorized boaters, folks out for a drive, snowshoers, x-country skiers, ATV riders,*



*snowmobilers, mountain bikers, and leaf peepers do not travel into our forests and onto our hills to enjoy a powerline scarring the land.”*

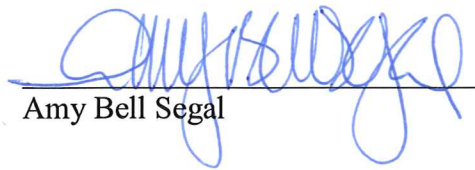
**Response.** Standard 1 in Section 480-D of the NRPA requires an applicant to demonstrate that a proposed activity will not unreasonably interfere with existing scenic and aesthetic uses. Similarly, LUPC’s rules allow utility facilities within P-RR subdistricts provided that the use can be buffered from other uses and resources within the subdistrict. LUPC Reg. 10.23,I(3)(d)(8). While portions of the Project may be visible, the line will not unreasonably interfere with anyone’s ability to fish, drive, hike, snowmobile, or enjoy other recreational or scenic or aesthetic uses. It has been adequately buffered from those other uses.

Exhibits

Exhibit CMP-5.1-A (Coburn Visibility Map and Pan Photos)

Dated: 3/22/19

Respectfully submitted,

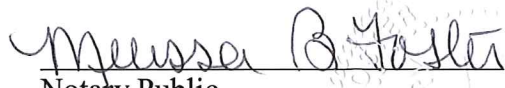
  
Amy Bell Segal

STATE OF MAINE  
Camden, ss.

The above-named Amy Bell Segal did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Before,

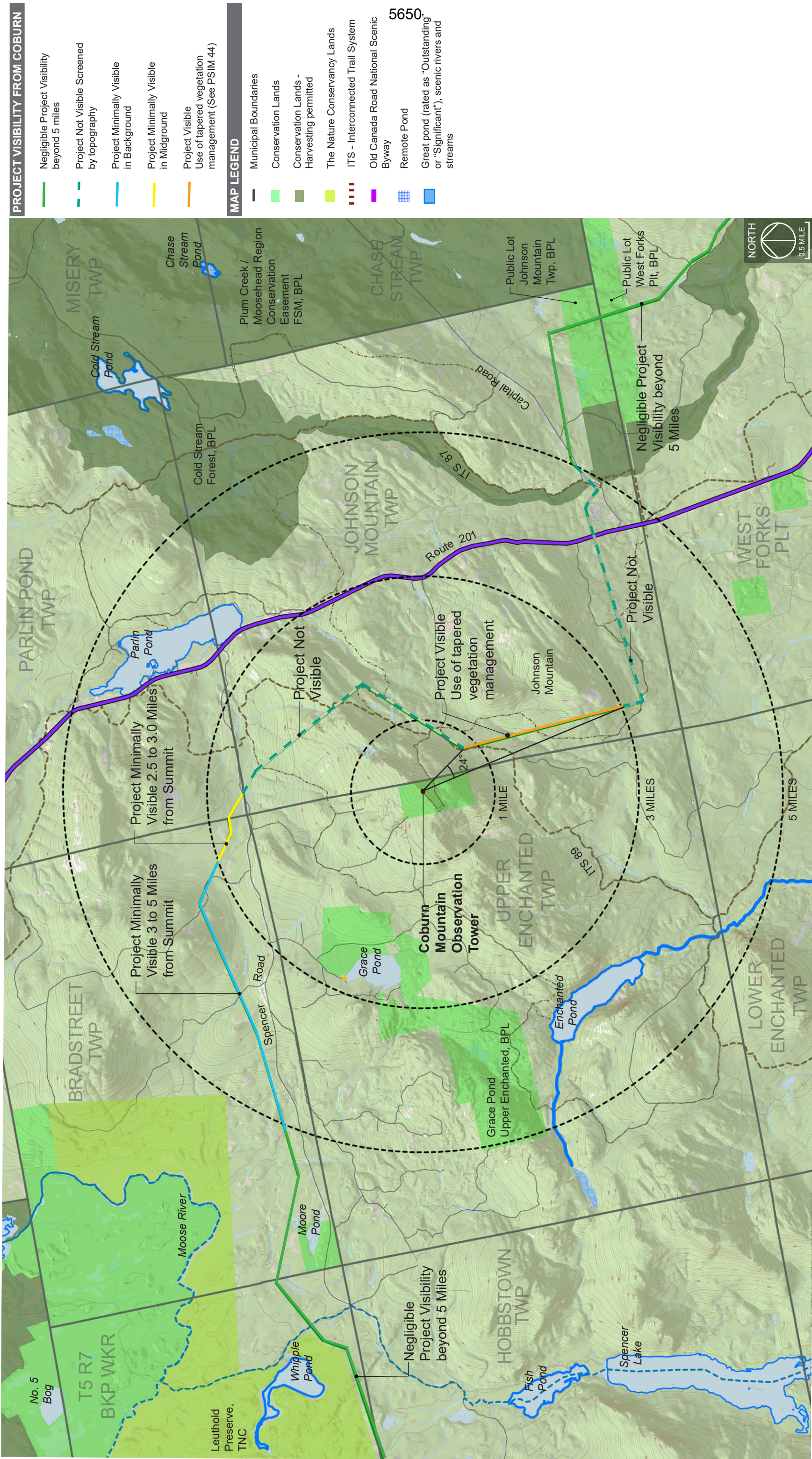
Dated: March 22/2019

  
Notary Public  
Name:  
My Commission Expires:

MELISSA B. FOSTER  
Notary Public State of Maine  
My Commission Expires July 23, 2023



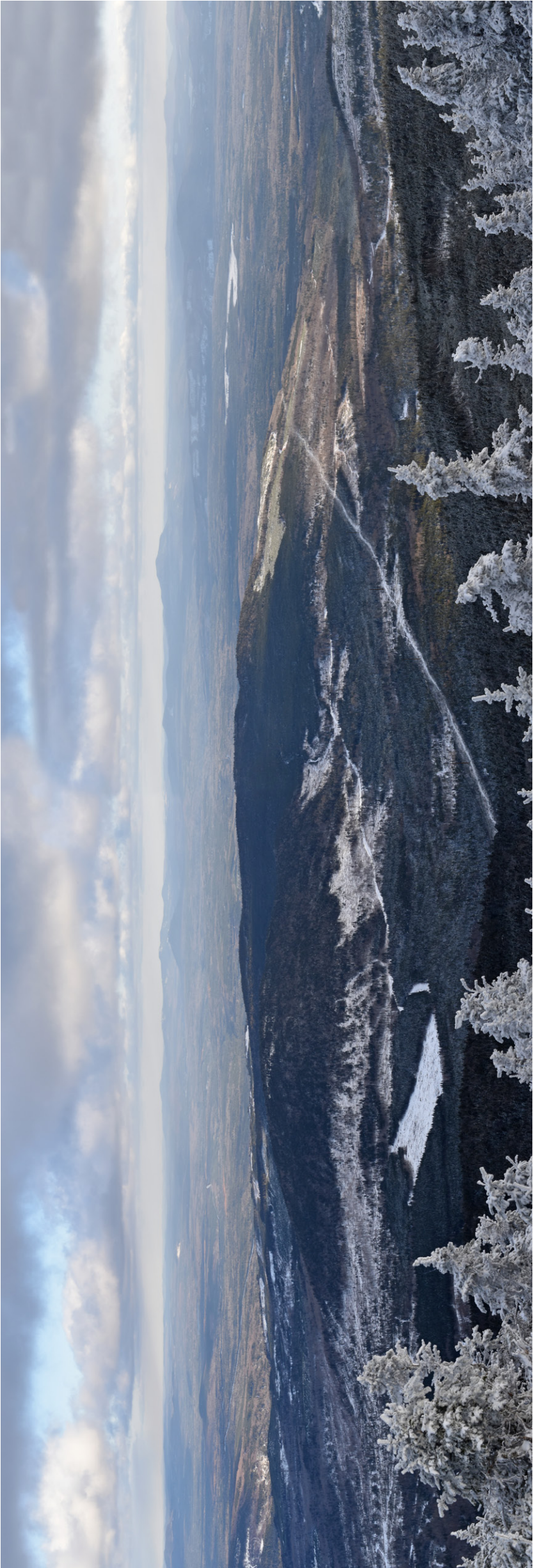






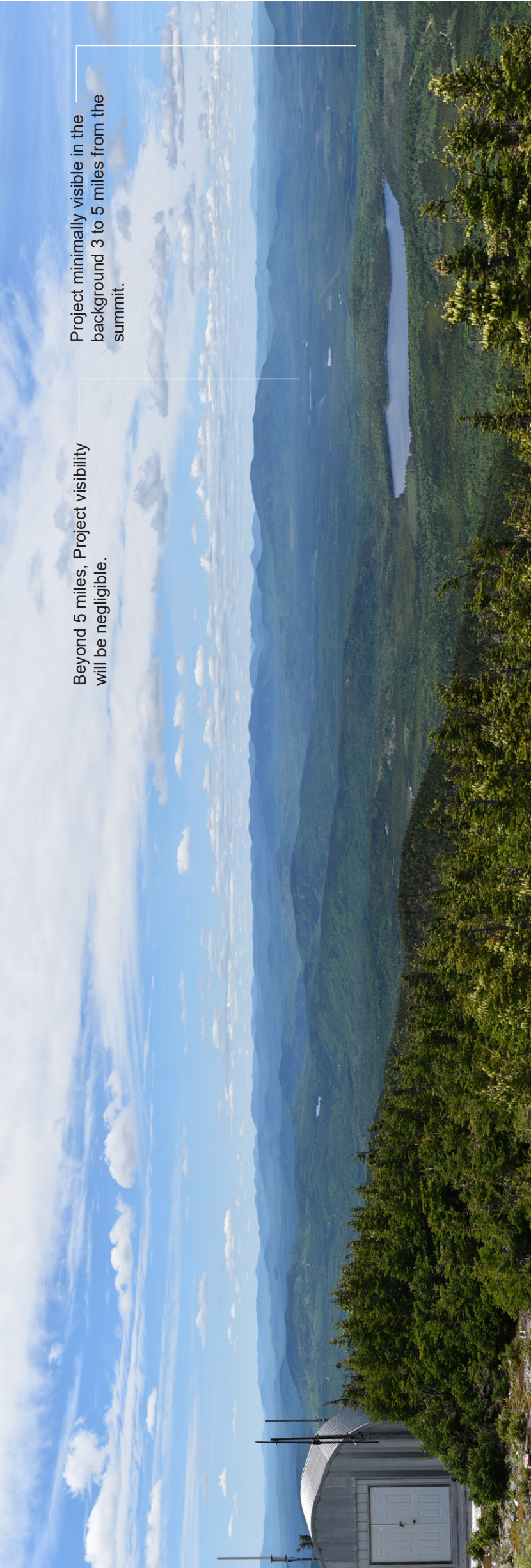


Photosimulation 8: Leaf-on panoramic view looking east to south from the summit of Coburn Mountain toward the proposed HVDC transmission line. Portions of the new 150' wide corridor clearing will be visible in the midground on the west side of Johnson Mountain and minimally in the background (beyond 5 miles) to the southeast. The closest visible structure will be 1.2 miles from this viewpoint.

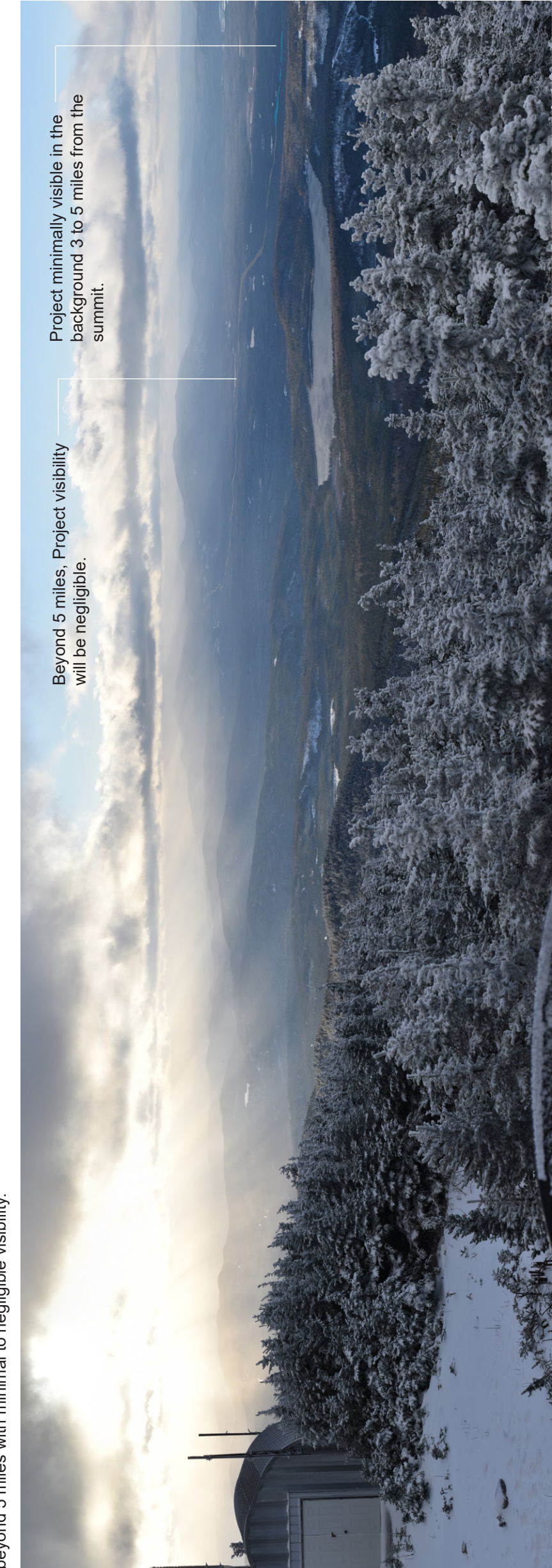


Photosimulation 44: Leaf -off / snow cover panoramic view looking east to south from the observation tower at the summit of Coburn Mountain in Upper Enchanted Twp toward the proposed HVDC transmission line. The visible portions of the proposed 150 ft wide corridor clearing will be maintained with tapered vegetation management to minimize the visibility of the corridor. The closest visible structure will be 1.0 mile from this viewpoint. The corridor will be seen in context with the active timber harvesting areas and haul roads that are typical in a working forest.



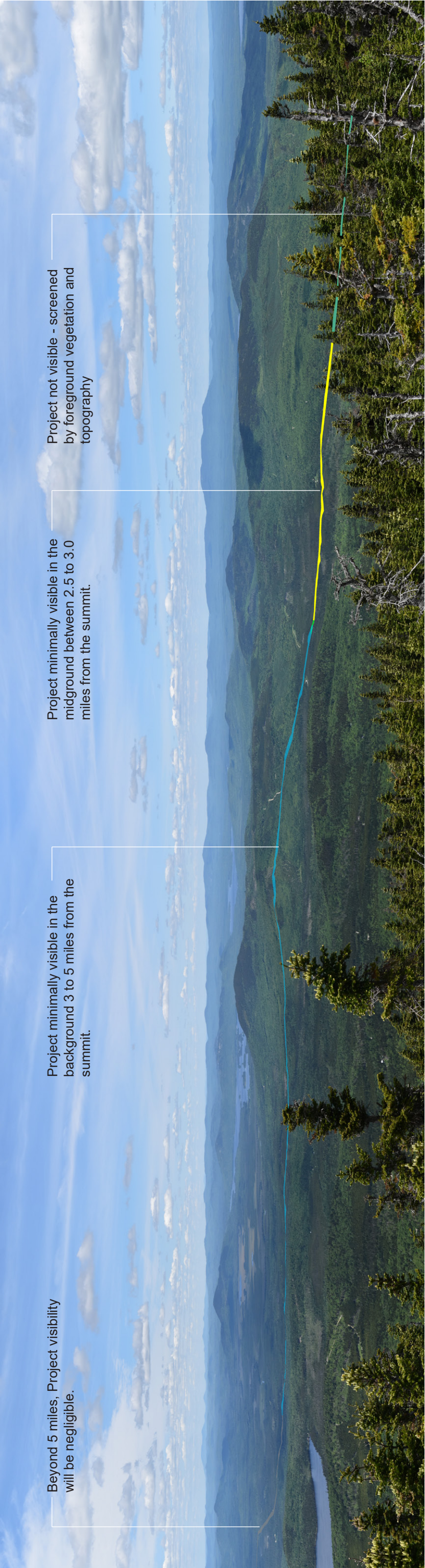


Leaf-on: View looking southwest to west from observation tower at the summit of Coburn Mountain. Grace Pond is visible in the midground. In this direction, the proposed HVDC transmission line will be beyond 5 miles with minimal to negligible visibility.



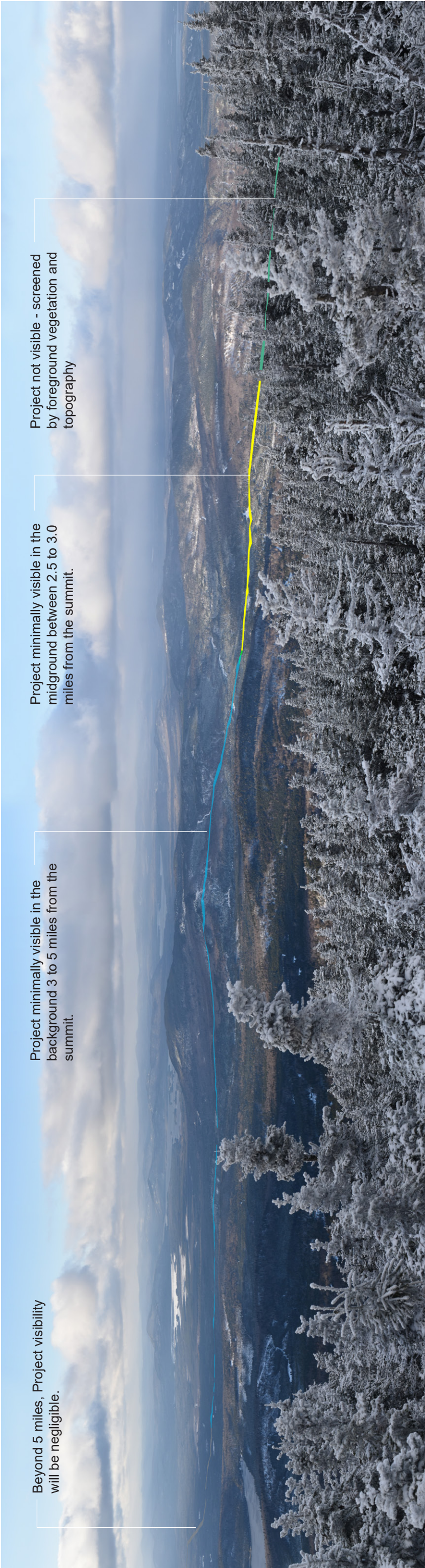
Leaf-off: View looking southwest to west from observation tower at the summit of Coburn Mountain. Grace Pond is visible in the midground. In this direction, the proposed HVDC transmission line will be beyond 5 miles with minimal to negligible visibility.





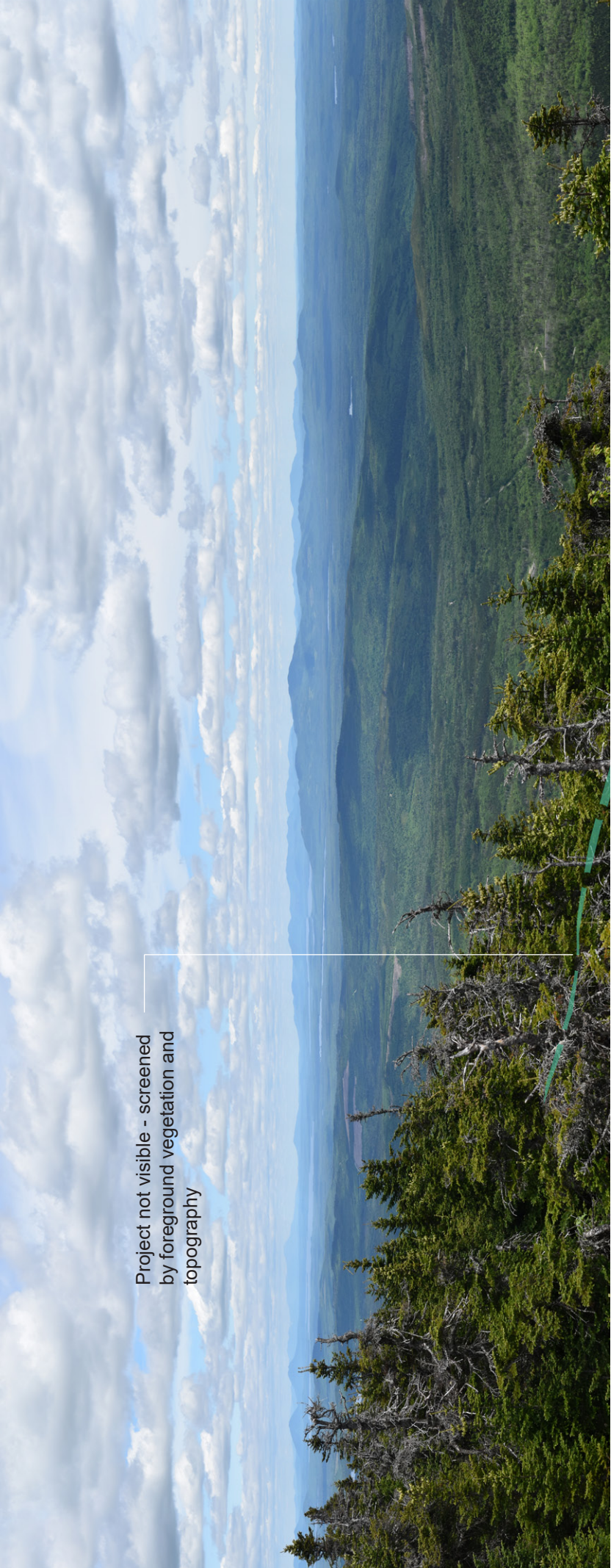
Leaf-on: View looking west to north from observation tower at the summit of Coburn Mountain.

5653



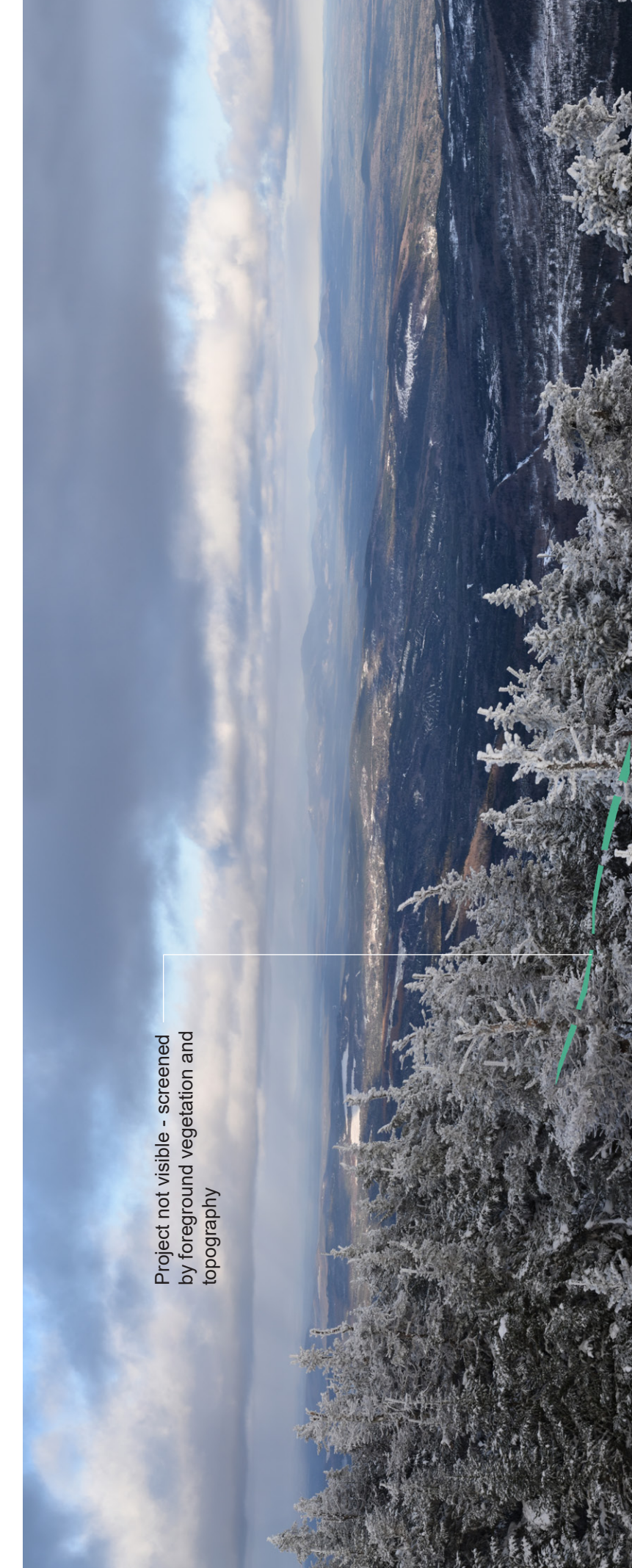
Leaf-off: View looking west to north from observation tower at the summit of Coburn Mountain.





Project not visible - screened  
by foreground vegetation and  
topography

Leaf-on: View looking northeast to east from observation tower at the summit of Coburn Mountain.



Project not visible - screened  
by foreground vegetation and  
topography

Leaf-off: View looking northeast to east from observation tower at the summit of Coburn Mountain.







STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED REBUTTAL TESTIMONY OF  
TERRENCE J. DEWAN

March 25, 2019

Regarding

- Issue 1: Scenic Character and Existing Uses

**I. Summary of Testimony (Relevant to DEP and LUPC Review)**

I hereby adopt the Rebuttal Testimony of Amy Bell Segal as if it were my own.

Dated:

March 22 2019

Respectfully submitted,

  
Terrence J. DeWan


STATE OF MAINE

Cumberland, ss.

The above-named Terrence J DeWan did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Before,

Dated:

March 22/2019  
Notary Public  
Name:  
My Commission Expires:

MELISSA B. FOSTER  
Notary Public State of Maine  
My Commission Expires July 23, 2023



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
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Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED REBUTTAL TESTIMONY AND EXHIBITS OF  
PEGGY DWYER

March 25, 2019

Regarding

- **Issue 1 (Scenic Character and Existing Uses): Buffering for Visual Impacts and Recreational and Navigational Uses**
  - Responsive to Intervenor Group 10 witness K. Barkley at 2:18
  - Responsive to Intervenor Group 10 witness E. Buzzell at 4:2 and 6; 4:23; 5:1; 5:6
  - Responsive to Intervenor Group 2 witness E. Caruso at 9-10
  - Responsive to Intervenor Group 4 witness J. Reardon at 7

## **I. Discussion (Relevant to DEP and LUPC Review)**

### **Issue 1 (Scenic Character and Existing Uses): Recreational and Navigational Uses**

- Responsive to Intervenor Group 10 witness K. Barkley at 2:18
- Responsive to Intervenor Group 10 witness E. Buzzell at 4:2 and 6; 5:6

The testimony of the above-cited Group 10 witnesses, to the effect that the New England Clean Energy Connect (NECEC) Project (Project) will unreasonably interfere with existing recreational uses, is overbroad, subjective, and incorrect. Objectively, the Project creates no impediment to the referenced recreational activities. The witness may exercise a choice to recreate elsewhere, but access and opportunity are unchanged as a result of the Project. In fact, the Project will not unreasonably interfere with existing recreational or navigational uses in any way; the only such impact will be some visual effect and, as established elsewhere that impact is not unreasonable and it does not interfere with existing uses.

To support this statement, consider the ongoing example of CMP's existing transmission line corridors, which are widely utilized year-round for private and commercial recreational activities including hunting, fishing, and foraging; hiking, biking, skiing, and snowmobiling; and birding and boating. The National Park Service chose to build a portion of its nationally recognized Appalachian Trail on an existing transmission line corridor. Similarly, access and opportunity for recreational pursuits in the new corridor portion of the Project will be unchanged. Other landowners own and maintain all the roads west of Route 201, thereby maintaining effective control of all recreational access outside the corridor.

### **Issue 1 (Scenic Character and Existing Uses): Buffering for Visual Impacts and Recreational and Navigational Uses Specific to the P-RR Subdistrict**

- Responsive to Intervenor Group 10 witness E. Buzzell at 4:23; 5:1
- Responsive to Intervenor Group 2 witness E. Caruso at 9-10
- Responsive to Intervenor Group 4 witness J. Reardon at 7.



Witnesses Buzzell and E. Caruso describe negative impacts of an overhead crossing, orange marker balls, and clearing to the edge of the Kennebec River. The Project has incorporated an underground crossing of the Kennebec River. There will be no clearing near, or other impacts detectable from, the Kennebec River in that location. There simply are no recreational or navigational impacts associated with the Kennebec River crossing, and no visual impact, as discussed in the direct and rebuttal testimony of CMP witnesses Amy Segal and Terry DeWan.

Finally, witness Reardon expresses concern that the transmission line corridor will become a pathway for motorized vehicles, including ATVs, increasing the risk of invasive species introduction. However, access to Beattie Pond will remain unchanged because there are no existing trails for off-road vehicles, nor will any be constructed as a result of the Project. The CMP corridor in Lowelltown Township is subject to existing access restrictions and a gate agreement limiting vehicular access near Beattie Pond. Exhibit CMP-7.1-A, Gate Agreement, provides that "...in the event that CMP develops a temporary or permanent road from Lowelltown Township T1R8 WBKP to Beattie Township T2 R8 WBKP, CMP agrees to place a gate and/or barrier across such road and manage the same as necessary to prevent vehicle access to Beattie Pond."

## **II. Conclusion (Relevant to DEP and LUPC Review)**

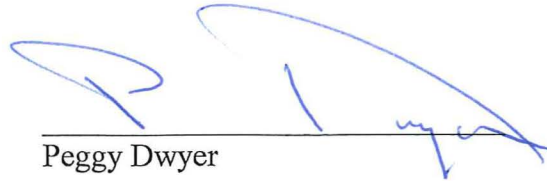
The Project will not adversely affect, nor will it unreasonably interfere with, existing recreational or navigational uses. The Project is adequately buffered from recreational and navigational uses within the Land Use Planning Commission's Recreation Protection (P-RR) subdistrict.

### Exhibits:

CMP-7.1-A: Gate Agreement

Dated: March 18, 2019

Respectfully submitted,



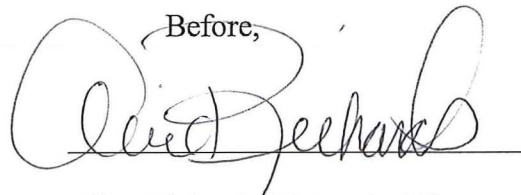
Peggy Dwyer

STATE OF MAINE  
Kennebec, ss.

The above-named Peggy Dwyer did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Dated: March 18, 2019

Before,



Alice Richards, Notary Public

My Commission Expires: Jan. 4, 2025





### AGREEMENT FOR USE OF GATES

This AGREEMENT, by and between **E.L. CARRIER, INC.** a Maine corporation having a mailing address of P.O. Box 489, Jackman Maine 04945, hereinafter called "Carrier" and **CENTRAL MAINE POWER COMPANY**, a Maine corporation having a mailing address of 83 Edison Drive, Augusta, Maine 04336, hereinafter called "CMP".

#### WITNESS

WHEREAS, Carrier granted to CMP certain easement rights over and across roads located in Beattie Township T2 R8 WBKP in a Road Access Easement Agreement dated April 14, 2017 and recorded in the Franklin County Registry of deeds in Book 3902, Page 340 (the "Easement"); and

WHEREAS, Item 7 "Use of Gates" in the Easement provides for access by CMP through gates across certain roads of Carrier by the use of a dual lock system; and

WHEREAS, Carrier and CMP desire to define the rules and obligations for the use of such gates.

NOW THEREFORE, Carrier and CMP, for consideration of the mutual covenants contained herein, agree as follows:

Rules for use of gates located on E.J. Carrier ownership in Beattie Township T2 R8 WBKP

1. Central Maine Power Company (CMP) will at its own cost, and consulting with E.J. Carrier (EJC), modify all existing gates across the access roads shown on a plan dated February 16, 2017 and recorded on April 18, 2017 in the Franklin County in plan file 6088 such that the gates can accommodate a dual locking system with one lock for the exclusive use of CMP, its employees, contractors, agents or those working for or through CMP (the CMP Users) and one lock for the exclusive use of EJC, its employee, contractors, agents, lessees or those working for or through EJC (the EJC Users).
2. The CMP Users will use the CMP lock only and will not have access to combinations or keys for the EJC lock.
3. The main gate into Beattie / Merrill Strip at the town line is kept open from June 1<sup>st</sup> to September 30<sup>th</sup>. Other than this period, the main gate and all other gates should remain closed and locked unless written permission is received to keep the gate open.
4. In the instances where the gate can be left unlocked, the gate should be in the locked open position if provisions have been made to do so and under all situations the CMP lock must be kept locked to prevent theft of the lock.
5. When the main gate is open between June 1<sup>st</sup> and September 30<sup>th</sup>, anyone may access the area behind the main gate by foot or with motorized vehicles (but not the areas behind secondary gates which remain locked). Other than this period, CMP Users will access the areas behind the locked gates only for work purposes. Possession of a key to the CMP lock does NOT grant the right of access through the gates for non-work purposes. Anyone caught driving through any gate for non-work purposes will be considered a trespasser and will be summonsed and prosecuted. (Walking and non-motorized bicycle riding past all of the gates for non-work purposes is permitted.) There are two hunting leases on the E.J. Carrier land in Beattie and Gorham Gore that grant exclusive hunting rights to the lessees so no one else is allowed to hunt on the property.
6. Damage to the gates, regardless of the cause, shall be reported as soon as reasonably possible to CMP as defined in Item 8. Photographs of the damage should be taken if possible and submitted with the report of the damage. There are surveillance cameras at some gates and the cameras are to be left alone. If a camera is visible from a gate, please report this to CMP.



7. Any new gate installed by EJC or EJC Users on the above referenced access roads will be built to accommodate a dual lock system. CMP may install new gates only with the written permission of EJC and such gates will be built to accommodate a dual lock system. Notwithstanding the above, in the event CMP develops a temporary or permanent road from Lowelltown Township T1 R8 WBKP to Beattie Township T2 R8 WBKP, CMP agrees to place a gate and/or barrier across such road and manage the same as necessary to prevent vehicle access to Beattie Pond.

8. Notice to CMP:

Alice Richards, Supervisor  
Real Estate Services  
Central Maine Power Company  
[alice.richards@cmpco.com](mailto:alice.richards@cmpco.com)  
207 242-0873 or 207 629-2173  
With a copy to:  
Legal Department  
Central Maine Power Company  
83 Edison Drive  
Augusta, Maine 04336

9. Notice to EJC:

Bill Jarvis, Agent  
Jarvis Forest Management  
[thetreeguy1999@gmail.com](mailto:thetreeguy1999@gmail.com)  
207 668-9516  
With a copy to:  
Larry Carrier, President  
E.J. Carrier, Inc  
P.O. Box 489  
Jackman, Maine 04945

10. This Agreement may only be modified in writing with the consent of both parties.

11. This Agreement shall be interpreted, construed and enforced according to the laws of the State of Maine.

In Witness Whereof, E.J. Carrier and Central Maine Power Company have set their hands and seals on this Agreement this 27<sup>th</sup> day of September, 2018.

Dense Conrad  
Witness

[Signature]  
Witness

E.J. Carrier, Inc.

[Signature]  
Larry R. Carrier, President

Central Maine Power Company

[Signature]  
Alice D. Richards  
Supervisor, Real Estate Services





STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
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Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
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West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED REBUTTAL TESTIMONY AND EXHIBITS OF  
KENNETH FREYE

March 25, 2019

Regarding

- **Issue 3 (Alternatives Analysis)**
  - Responsive to Intervenor Group 4 witness Dr. David Publicover
  - Responsive to Intervenor Group 2 witness Elizabeth Caruso, Town of Caratunk
  - Responsive to Intervenor Group 4 witness Jeff Reardon, Trout Unlimited

**I. Qualifications of Witness (Relevant to DEP and LUPC Review)**

My name is Kenneth Freye. I am a Maine resident and a partner at Dirigo Partners, Ltd., a Maine company that provides real services and project support primarily to electric utilities. I

have over thirty years of experience siting, acquiring, managing, and selling real estate associated with electric utilities. I also have over twelve years of experience as a forester and land transaction manager with an industrial forest landowner. My formal education consists of a BS degree in Forest Management and a MS degree in Forest Management and Economics, both from Michigan State University. I am a licensed forester and real estate broker in Maine. My resume is attached as Exhibit CMP-9-A.

## **II. Discussion (Relevant to DEP and LUPC Review)**

### **Response to Intervenor Group 4 witness Dr. David Publicover**

On page 3, beginning on line 16, the Dr. Publicover states that the “project would significantly degrade the experience of Appalachian Trail users at the crossing” and again on page 26, beginning on line 13, he states that “the new line would make the situation worse.” These statements are entirely subjective, incorrect, and are undermined by the language of the February 18, 1987 easement (Easement) that CMP granted to the United States of America for the Appalachian Trail (AT) to cross CMP’s land. See Exhibit CMP-9-B (Easement recorded in the Somerset County Registry of Deeds in Book 1324, Page 19).

The recitals in the Easement state that its intent was to acquire “lands or interest in lands within the right-of-way of the Trail [the Appalachian National Scenic Trail] sufficient to assure perpetual use and protection for the purposes provided by the Act [the National Trails System Act, Public Law 90-543 (82Stat. 919) as amended].” However, the Easement specifically reserves CMP’s right to construct electric transmission lines in the corridor that the AT crosses. It states as follows, on pages 2-3:

the above-granted right and easement shall not be interpreted or exercised to, in any way, interfere with the Grantor [CMP], its successors and assigns, erection, construction, maintenance, repair, rebuilding, respacing, replacing, operation, patrol and removal of electric transmission, distribution and communication lines

consisting of suitable and sufficient poles and towers with sufficient foundations, together with wires strung upon and extending between the same for the transmission of electric energy and intelligence, together with all necessary fixtures, anchors, guys, crossarms, and other electrical equipment and appurtenances, or the clearing and keeping clear Tract 108-04 [the Easement area] of all trees, timber and bushes growing on said tract only by such means as the Grantor, its successors and assigns, may select which do not interfere with the footpaths continuity or endanger hiker's passing along the footpath.

Clearly, the U.S., through the National Park Service (NPS), anticipated and agreed to the construction by CMP of additional electric transmission lines, and related clearing, in the CMP-owned corridor that the AT crosses. This language demonstrates that the U.S. acquiesced in these actions, and did not believe them to be inconsistent with the purpose of the Easement, as stated in the recitals. Neither the NPS nor the Appalachian Trail Conservancy (ATC), its agent, has stated that CMP's proposed use of the Easement area is inconsistent with the purpose of the Easement. While Dr. Publicover may believe the Project will degrade the experience of hikers, this opinion is not supported by – and in fact is contradicted by – the visual impact analysis, the Easement, and NPS. In fact, the impact – to the extent it exists – cannot be considered unreasonable, given that the impact is to a use that occurs on CMP's land, with the understanding that the use is allowed only with the possibility that an additional transmission line could be constructed in this location.

On page 3, line 20, Dr. Publicover states, “the opportunity exists to improve rather than degrade the user's experience.” On page 28, line 4, he states that the AT should be relocated. The decision to relocate the AT rests with the NPS, assuming it can arrange sufficient alternative property rights. It is not within CMP's control. Nevertheless, CMP engaged with the ATC and Maine Appalachian Trail Club (MATC) in discussions concerning the possibility of relocating the AT footpath (the traveled way) to minimize the number of times it crosses the existing corridor, in which the Project will be located. Alternative alignments or locations of the



transmission line, on the other hand, would not be reasonable or reasonably available because they would result in crossings of the AT in one or more locations where there are no existing transmission line corridors, thus having greater impact on the AT.

The AT footpath crosses CMP's existing corridor containing a 115 kV transmission line in three locations adjacent to Moxie Pond and Trestle Road in Bald Mountain Township. See Exhibit CMP-3-D; CMP-8-J. CMP has had several meetings with members of the ATC and MATC to discuss possible relocations of these short portions of the AT footpath:

- A relocation of the trail that would avoid the first west-to-east crossing and the second east-to-west crossing (Troutdale Road) by rerouting the AT footpath across a camp lot on the west side of Troutdale Road. However, the ATC and MATC elected not to pursue this option because it would pass within view of the cottage on the camp lot. They considered that less desirable than leaving the trail in the current location.
- A relocation of a portion of the AT footpath on the east side of Baker Stream, where the footpath currently parallels or is within CMP's corridor for about 1,000 feet before crossing the currently cleared portion of the CMP corridor. Re-routing the AT footpath slightly to the west of the existing CMP corridor, but staying within the AT-owned land until the footpath approaches the existing crossing point, could be done at the discretion of the agencies without the need for anything from CMP. CMP believes the ATC and MATC are willing to pursue this relocation and CMP will support the cost of doing so if the ATC and MATC elect to move forward with this relocation, and if the National Park Service approves of it.
- A relocation of the eastern-most crossing of the corridor, at which point the AT footpath is south of Joe's Hole and east of Baker Stream. However, the ATC and MATC elected not to pursue this option, and instead asked if CMP would consider adding plantings of non-capable species to provide visual screening along the open section of the footpath as it crosses CMP's corridor. ATC and MATC members reviewed the plant species CMP proposed for buffering near Joe's Hole and Troutdale Road, and they consider those appropriate for this location as well. CMP is willing to add these plantings should MATC and ATC so request. The screening effects of these plantings will minimize the view of the existing transmission line and the NECEC transmission line from the AT footpath.

In any event, as noted above and as discussed in the pre-filed direct testimony of CMP witnesses Gerry Mirabile, Mark Goodwin, and Amy Segal, CMP has proposed planted

vegetative buffers along both sides of Troutdale Road (co-located with the AT in this area) to minimize the Project's visual impact on the AT. Those plantings provide sufficient buffering for the AT, given the current use of the corridor by an existing transmission line.

On page 19, beginning on line 10, Dr. Publicover alleges that CMP could bury the NECEC transmission line along the edge of the Spencer Road to avoid forest fragmentation, and on page 20, beginning on line 3, he states that such burial would have less environmental impact than the proposed corridor. But this is not a practicable alternative, nor is it reasonably available to CMP.

Spencer Road is not a public road. It was built and is maintained for the management of the industrial forest landowners whose land is accessed by that road. Plum Creek Maine Timberlands LLC (PCT), the then-primary forest landowner along Spencer Road, did not want and would not agree to any alignment of a transmission line that would adversely affect the management of its land. It specifically did not want a transmission line located along the Spencer Road because a transmission line located along the road, whether overhead or underground, would limit the landowner's ability to ditch, blast, create, and use landings, operate heavy equipment, or relocate the road. Construction activity, particularly for an underground transmission line located close to the road, would create congestion and limit the industrial forest landowners' ability to transport timber and access their land.

Thus, routing the Project along Spencer Road is not an available alternative. In addition, as discussed elsewhere in CMP's testimony, burying the NECEC transmission line in these locations is not reasonably available or practicable.

In summary, the statements that the NECEC transmission line will degrade the Appalachian Trail corridor are incorrect and subjective. The NPS anticipated the construction of

additional lines and additional clearing when it acquired the easement for the Trail. There is no objective evidence to indicate that the NECEC transmission line conflicts with the intent of the National Trails System Act. Further, placing the NECEC line either underground or overhead next to the Spencer Road conflicts with the landowner's use of its property. It was not possible to obtain rights for the transmission line in that area.

**Response to Intervenor Group 2 witness Elizabeth Caruso, Town of Caratunk**

On page 6, beginning at line 4, Ms. Caruso states “there already exists a corridor from the Quebec border on the other side of Route 201. CMP could easily have used this corridor. It's quite simple and is even listed in the MOU with Western Mountains and Rivers Corporation.” This statement is incorrect. Because of the lack of specificity as to the location of this mystery corridor and the reference to the memorandum of understanding (MOU) with Western Mountains and Rivers Corp. (WMRC), I will attempt to address all of possible misconceptions.

First, CMP does not own a corridor that connects to Quebec in the upper Kennebec River area, other than the Preferred Route of the proposed NECEC transmission line. There is a distribution line from Harris Dam to the village of Jackman (the Jackman Tie Line or JTL). The JTL extends west from Harris Dam to a point on Route 201 in West Forks Plantation south of the Johnson Mountain town line. From that point to the Town of Jackman, about 18 miles, the JTL is a standard roadside distribution line located within the highway limits of Route 201. The JTL originally diverged from Route 201 about 1.5 miles south of the intersection of Routes 201 and 6/15 in the village of Jackman, and was located on a 100-foot wide easement for about 1.75 miles to the termination on Coburn Avenue in Jackman. That cross-country section was abandoned, however, and the JTL is now entirely roadside, terminating on Route 6/15.

This could be the corridor that Ms. Caruso mistakenly believes connects to Quebec. It does not; the JTL terminates in Jackman about 16 miles from the Canadian border. Not only would new corridor need to be acquired through the towns of Jackman and Moose River, but corridor would need to be acquired along Route 201, a designated scenic highway, for the entire distance from Jackman to West Forks Plantation. In addition, the JTL corridor between Harris Dam and Route 201 would need to be expanded through two conservation easements and across the State-owned Cold Stream Forest.

The other possibility, based on the MOU between WMRC and CMP, dated May 30, 2018, is the reference to the “Old Rail Bed from Indian Pond to Route 15 in Rockwood,” which is a potential donation parcel. This 99-foot-wide parcel does not connect to the transmission line that terminates at Harris Dam; there are over nine miles and two conservation easements between Harris Dam and the southern end of the old rail bed. The entire old rail bed is less than eight miles long and the north end terminates over thirty miles from the Canadian border. The old rail bed does not have sufficient width for the NECEC transmission line and much of the distance is subject to an easement for a major logging road. The old rail bed is the only linear parcel referenced in this agreement.

On page 6, line 8, Ms. Caruso references burying the NECEC line in a pre-existing corridor along Route 201 or under pre-existing dirt roads. As stated above, there is no corridor along Route 201; the existing distribution line is within the highway limits. Further, aside from cost and environmental issues, excavation near any electric line, and particularly next to distribution lines because of their low ground clearance, is extremely dangerous. Additional width along this designated scenic highway would need to be acquired and cleared to facilitate a



buried transmission line. Please see my rebuttal testimony to Dr. Publicover, above, for a discussion on the use of private roads for siting transmission lines.

In summary, there is no CMP corridor connecting the Province of Quebec with CMP transmission lines in the upper Kennebec River area other than the preferred route of the NECEC Project. CMP does not own a transmission line corridor along Route 201, and acquiring one would not be practicable or reasonably available. Statements to the contrary are wrong and misleading.

**Response to Intervenor Group 4 witness Jeff Reardon, Trout Unlimited (Relevant to DEP Review Only)**

*Gold Brook & Rock Pond Area*

On page 14, on the continuation of item 1, Mr. Reardon states that all of the impacts to Gold Brook and Rock Pond could have been avoided if the NECEC corridor had been located one-half a mile to the north or south to avoid Gold Brook and Rock Pond. This statement ignores both the land ownership in this area or the topography.

The first constraint in this area is the land ownership. The Nature Conservancy (TNC) acquired a large parcel of land on the north side of Spencer Road beginning at approximately the north end of Rock Pond and extending west nearly two miles. This parcel was either under contract or in serious consideration for sale when CMP began discussions with PCT in 2014, and one of PCT's concerns was to avoid any effect on the proposed sale to TNC. I contacted Tom Rumpf at TNC very early in the siting of the corridor. He stated that TNC would not object to a transmission line corridor abutting the TNC land but would not allow a transmission line corridor to cross TNC land. This constraint alone precluded moving the NECEC corridor to the north.

PCT sold the land to TNC in a deed dated June 24, 2015 and recorded in the Somerset County Registry of Deeds in Book 4923, Page 231. The subsequent alignment of the NECEC corridor avoided TNC land. Further, it was my understanding at the time that PCT was contemplating selling additional land to TNC, and PCT's desire was to keep the NECEC transmission line corridor as close as possible to the T7 R5 BKP WKR (Raytown) / T4 R6 BKP WKR (Hobbs town) town line.

Moving the corridor north to avoid Gold Brook would not have been possible because of TNC ownership.

Aside from TNC ownership, the land on the north side of Spencer Road in the area where the corridor crosses Gold Brook is very steep, with some area having nearly sheer rock faces. It would be impracticable, if not impossible, to construct in this area. Given the topography, the corridor also would be more visible from Rock Pond.

Moving the corridor to the south any distance also has terrain problems, and does not eliminate the stream crossings to which Mr. Reardon objects. Gold Brook flows from the southwest to the northeast between Three Slide and Tumbledown mountains. Depending on the distance the corridor would be moved to the south, but not exceeding the half-mile suggested by Mr. Reardon, the corridor would cross both Gold Brook and a major tributary to Gold Brook, would be above the 2700-foot elevation, would cross open sub-alpine areas, and would be visible from virtually all of Rock Pond and Iron Pond. The corridor would also need to cross Baker Stream and the associated inland waterfowl and wading bird (IWWH) zone south of Rock Pond. Exhibit CMP-9-D shows the Gold Brook – Rock Pond area.

I made substantial efforts to avoid and minimize potential impacts to the stream habitats in siting this corridor. However, I also had to weigh the availability of alternative routes, other

non-stream impacts of other routes, as well as the fact that other routes could impact the same stream habitats. In some cases, the stream habitat impacts of alternate routes would have been greater than the route selected. As with the other suggestions in the prefiled testimony to improve the location of the corridor, the person making the suggestion has no experience with siting linear infrastructure, glosses over the physical and social constraints, and only partially considers even the consequences directly relevant to their specific concern.

*Lower Enchanted and Basin Tracts*

Mr. Reardon states on page 22, in items 5 and 6, that the conservation value of the Lower Enchanted Tract and Basin Tract is limited because it protects only one shore of the Dead River, and that there is no protection of the watershed along Enchanted Stream upstream of the Lower Enchanted Tract. These statements are both misleading and incorrect.

Except for the CMP Lower Enchanted proposed compensation parcel, the north side of the Dead River between Grand Falls and Salmon Stream, which is just upstream from the West Forks Plantation village, is owned by Western Mountains Charitable Foundation and protected by a conservation easement held by Maine Bureau of Parks and Lands. The Lower Enchanted Tract being offered as compensation by CMP completes the protection of the north side of the Dead River in this roughly 12¼-mile segment of river. The north end of the Lower Enchanted Tract extends along Enchanted Stream to virtually the southern end of a 275 +/- acre IWWH zone that provides protection to Enchanted Stream and Lower Enchanted Pond, upstream of the Lower Enchanted Tract.

CMP is proposing preservation of the Basin Tract is located on the south side of the Dead River because the north side is protected by the above-mentioned Western Mountains Charitable

Trust conservation easement. The preservation of the Basin Tract will complete the protection of both sides of the Dead River for 4.8 miles. See Exhibit CMP-9-E

*Cold Stream Crossing*

Mr. Reardon comments on page 11, item 3, that the location where the NECEC corridor crosses Cold Stream in Johnson Mountain Township is particularly impactful due to proximity to feeder streams and the proximity to Weyerhaeuser Company's private road, generally known as the Capital Road. These statements are misleading. The unnamed feeder stream on the east side of Cold Stream, while on CMP land, is not in the NECEC transmission line corridor and will not be cleared. The "feeder stream" on the west side of Cold Stream is a wetland with no stream channel present, as determined by a qualified wetland scientist. I have personally inspected this area and concur that the mapping is correct. This is also an area where an adjustment was made to the corridor to place the angle structure outside of the wetland.

The location where the NECEC corridor crosses Cold Stream is very open. The entire stream channel is visible on aerial imagery, due in part to the current location of Capital Road on the south side of the NECEC corridor and the former location of the Capital Road on the north side of the corridor. Tree cover between the two roadways is sparse and, based on ground inspection of the former location of the Capital Road, the area will revegetate quickly with alders and other non-capable species to provide stream-side cover and shade along the edges of Cold Stream. Indeed, regrowth of this type of vegetation has already begun.

The language and structure of the deed for the Cold Stream Forest (CSF) parcel makes placing transmission lines on or across the CSF very difficult. PCT, which was in the process of selling the CSF lands to the State of Maine in late 2015 (the conveyance occurred on March 10, 2016, Somerset County Registry of Deeds, Book 5012, Page 292), advised CMP that PCT would



not entertain any alignment that affected the pending sale of the CSF. Had the parties to the acquisition of the CSF been open to an alignment across the CSF, CMP would have seriously considered expanding the existing 100-foot-wide Jackman Tie Line corridor, which crosses Cold Stream about  $\frac{3}{4}$  of a mile downstream of the NECEC corridor. However, the restrictions placed on crossing the CSF made the gap at the Capital Road crossing the only viable location for the NECEC transmission line corridor. See Exhibit CMP-9-F

Tomhegan Stream Crossing

Likewise, Mr. Reardon states on page 12, item 4, that no alternative was considered for the location where the NECEC corridor crosses Tomhegan Stream in West Forks Plantation. In fact, alternative locations were considered where the NECEC transmission line corridor crosses Tomhegan Stream.

The proposed corridor location is the result of several adjustments to the corridor location. In the very early stages of the siting process, an alignment to the east was considered, but rejected, because the alignment would have crossed both the outlet stream from Wilson Hill Pond and Tomhegan Stream. The corridor was moved approximately 2,000 feet west to substantially its current location prior to commencing wetland mapping. In the wetland mapping process, the extensive wetlands in this area were noted and the tangent was shifted approximately 100 feet to the southwest to minimize the wetland impacts.

This is an area where Tomhegan Stream consists of one primary channel and a number of braided channels flowing through an area with sparse tree cover. Moving the NECEC transmission line any substantial distance to the southwest would place the NECEC corridor close to or over the outlet stream from Little Wilson Hill Pond. See Exhibits CMP-9-G and CMP-9-H for an overview and detail of the Tomhegan Stream area.

### Summary

In summary, the relocations recommended by Mr. Reardon in the Gold Brook – Rock Pond area are impractical from both a physical and social standpoint, and are neither practicable nor reasonably available. The proposed relocations would involve placing the NECEC transmission line corridor over protected lands and/or on steep slopes. In some situations, the corridor would be more visible from Rock Pond. Mr. Reardon’s testimony offers no evidence that the current location, with the modifications to structure height, does not provide sufficient protection to Gold Brook and Rock Pond.

Mr. Reardon’s characterization of the Basin Tract and Lower Enchanted Tracts fails to consider how these parcels integrate with the surrounding lands that are currently protected with conservation easements and protective zoning. He offers no evidence that protecting only one side of a stream does not provide environmental benefits.

Finally, the stated issues with the Cold Stream and Tomhegan Stream crossing locations do not accurately consider the physical and landownership constraints that exist. The statement that the perceived impacts could have been avoided is subjective, unfounded, and not supported by an examination of the land ownership and resources.

### **III. Conclusion (Relevant to DEP and LUPC Review)**

The above referenced testimony of Dr. Publicover, Ms. Caruso, and Mr. Reardon is subjective, incorrect, and misleading. All three witnesses do not consider, or gloss over, factual information, physical conditions, and social constraints. Contrary to their contentions, and as demonstrated by my testimony and the testimony of other CMP witnesses, there are no practicable or reasonably available alternatives to the Project locations; the Project has been carefully sited to minimize environmental and visual impacts.

Exhibits:

CMP-9-A: Resume of Kenneth Freye

CMP-9-B: CMP to USA Easement

CMP-9-C: Appalachian Trail Location

CMP-9-D: Gold Brook – Rock Pond Area, Appleton Township

CMP-9-E: Dead River Compensation Tracts, Spring Lake, Pierce Pond and Lower Enchanted Townships

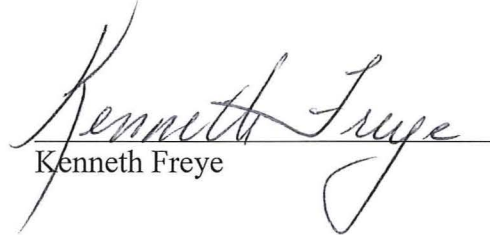
CMP-9-F: Cold Stream Area, Johnson Mountain Township

CMP-9-G: Tomhegan Stream Area Overview, West Forks Plantation

CMP-9-H: Tomhegan Stream Area Detail, West Forks Plantation

Dated: March 13, 2019

Respectfully submitted,

  
Kenneth Freye

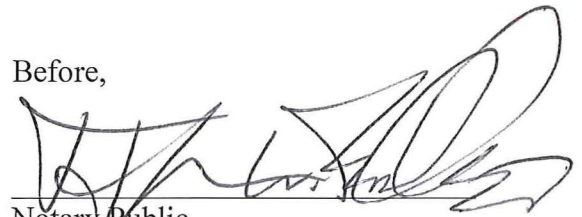
STATE OF MAINE

Kennebec, ss.

The above-named Kenneth Freye did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Dated: March 13, 2019

Before,



Notary Public

Name:

My Commission Expires:

**Tyler W. Bradbury**  
Notary Public, State of Maine  
My Commission Expires August 18, 2025





✓



# Ken Freye

## Expertise

- Project Management
- Resources & Real Estate Management
- Land Acquisition
- Negotiations
- Contracts

## Education

- BS Forest Management, Michigan State University
- M.S. Forest Management & Economics, Michigan State University

## Registration

- Licensed Real Estate Broker, State of Maine (current)
- Licensed Forester, State of Maine (current)

## Professional Experience

Dirigo Partners Ltd.  
2013 – present

Burns & McDonnell  
2010 – 2013

Central Maine Power Company  
1988 – 2010

International Paper Company  
1976 - 1988

## Experience

### Dirigo Partners, Ltd.

*Maine, 2013-present*

Ken manages the capital projects for Dirigo Partners and is a partner in the firm. His experience as a corporate real estate manager gives him insight into our clients' needs. He has demonstrated proficiency in financial and economic analysis, project development and management, and real estate, contract, and land use issues. Ken has extensive knowledge of utility real estate ownership and needs, and has a solid working knowledge of electrical transmission and substation design and corresponding real estate needs. He is a Licensed Real Estate Broker and Forester in the State of Maine.

### Burns & McDonnell

*Maine, 2010-2013*

Ken was a project manager at Burns & McDonnell (BMCD) where he continued to work on the more complex real estate issues of Central Maine Power Company's Maine Power Reliability Program, as well as electric transmission projects in Oklahoma and Pennsylvania (see below). Ken was also involved in siting and project cost / resource planning for projects in the Indiana and Utah-Colorado-Wyoming.

### Central Maine Power Company

*Maine, 1988 - 2010*

As Manager of Real Estate Services, Ken completed all transmission, substation, service facility, and communication site acquisition projects. He was a leader of the Land Team, responsible for the team charged with all real estate due diligence, translation of electrical diagrams into real estate documents, contract negotiations, and preparation of real estate documents. He further managed portfolios of timberland, recreation properties, residential and commercial properties, utility facilities, and rights-of-way.

### International Paper Company

*Alabama, Vermont, Maine, 1976 - 1988*

Progressed from Forester to Manager, Economics and Real Estate. Evaluated large tracts of commercial timberlands for potential sale including the gathering of timber growth and inventory information for wood products marketing projections; experienced in statistical sampling techniques. Negotiated the purchase or exchange of commercial timberlands with the largest tracts exceeding 50,000 acres. Developed economic analysis models for evaluating timberland transactions and land exchanges. Responsible for the sale of surplus lands and facilities.

## Select Projects

### New England Clean Energy Connect, Central Maine Power Company

*Maine, 2014 - present*

Ken managed the siting, acquisition, survey, and wetlands mapping for a new 50+ mile corridor and associated substation sites connecting existing Central Maine Power Company (CMP) transmission lines with the Province of Québec, Canada. The project involved complex negotiations with public agencies as well as private and



## Ken Freye (continued)

industrial forest landowners, in addition to managing subcontractors for aerial imagery, surveys, and environmental work. The corridor acquisition phase of this project is complete and has entered engineering design and permitting, where Ken and Dirigo Partners continue to be significant contributors.

### **Pittsfield to Keene Road, 345kV, Maine Electric Power Company, Inc.** *Maine, 2015 - present*

Ken managed the siting and acquisition of a new 345 kV corridor approximately 70 miles long involving greenfield and co-location with over 170 acquisition parcels. He developed acquisition protocols, documents, target acquisition cost tables and project metrics, and manages the ongoing efforts of the acquisition team. Currently 96% of parcels are secured. This project is a collaborative effort of CMP and Emera Maine through their wholly owned subsidiary, Maine Electric Power Company, Inc.

### **Susquehanna to Roseland Project, PPL Electric Utilities** *Pennsylvania, 2012 - 2013*

While with Burns & McDonnell (BMcD), Ken joined the construction management team on a 100-mile 500 kV transmission line link between Pennsylvania and New Jersey, focusing on obtaining Highway Occupancy Permits from PennDOT, quality assurance/ quality control of all land rights, licenses, and access rights obtained by PPL, and evaluation of existing rights for fiber optic communications. BMcD was able to update and create real estate layers in its GIS system as a result of the QA/QC process. Ken also assisted in resolving encroachments and landowner access issues, and improving stakeholder relations.

### **Maine Power Reliability Project, Central Maine Power Company** *Maine, 2007 - 2014*

Ken first managed this program as the manager of CMP's real estate department and then as a project manager working for BMcD. The 450-mile, 4000+ parcel Maine Power Reliability Project consisted of both corridor expansion, new corridor, and construction/reconstruction within existing corridors. As the CMP real estate manager, Ken was responsible for overseeing all real estate related activities, including rights and restrictions investigation, options, acquisitions, encroachments, licensing, valuation, property inspection, relocation, and property management. Ken continued on this project as project manager for BMcD, focusing on acquisition strategy, quality assurance, condemnation strategy and execution, affiliate transactions, and the transfer of mitigation parcels. Ken also was a member of the team that resolved A/C voltage and current issues related to parallel occupancy and crossings of pipelines, communication cables, and railroads within the Extremely High Voltage transmission line corridor.

### **Oklahoma 345 kV Projects, Oklahoma Gas & Electric (OG+E),** *Oklahoma, 2011 - 2012*

Ken was Program Coordinator for BMcD on real estate issues on the three OG+E 345 kV projects, providing insight and solutions with a focus on reducing condemnations and improving stakeholder relations.





BX1324 PG018

## GRANT OF EASEMENT

01477

THIS INDENTURE, made this 18<sup>th</sup> day of February.

1982, by and between CENTRAL MAINE POWER COMPANY, a corporation organized and existing under the laws of the State of Maine, and having its principal place of business at Edison Drive, Augusta, Maine 04336, hereinafter referred to as the GRANTOR, and the UNITED STATES OF AMERICA, Washington, DC 20240, hereinafter referred to as the GRANTEE.

WITNESSETH: WHEREAS, the National Trails System Act, Public Law 90-543 (82 Stat. 919), as amended, hereinafter referred to as the ACT, designated the Appalachian National Scenic Trail, hereinafter referred to as the TRAIL, as a part of a national system of trails in order to provide for the ever-increasing outdoor recreational needs of an expanding population and in order to promote public access to, travel within, enjoyment of, and appreciation for the outdoor areas of the Nation, and to provide for the conservation and enjoyment of the nationally significant scenic, historical, natural and cultural qualities of the Trail; and,

WHEREAS, Section 7 of the Act authorizes the Secretary of the Interior, hereinafter referred to as the SECRETARY, to acquire lands or interests in lands within the right-of-way of the Trail sufficient to assure perpetual use and protection for the purposes provided by the Act; and,

WHEREAS, the Secretary, acting by and through the National Park Service, has determined that it is necessary in order to preserve and protect the Trail for the purposes provided in the Act to acquire interests in this certain real property owned by the Grantor;

BK1324 PG020

NOW THEREFORE, the Grantor, in consideration of the sum of ELEVEN THOUSAND FIVE HUNDRED AND NO/100 DOLLARS (\$11,500.00), the receipt and sufficiency whereof are hereby acknowledged, does hereby grant, bargain, sell and convey with WARRANTY COVENANTS unto the said Grantee and its assigns, forever, a perpetual, exclusive, and assignable right and easement consisting of the right to control and manage the land only in accordance with the provisions and intent of the National Trails System Act, to construct, manage, use, and maintain the Trail primarily as a public footpath including the right to permit members of the public to traverse the area, and for other purposes as may be required in connection with the construction, management, development, use, and maintenance of said Trail.

IT IS CONCLUSIVELY presumed that any and all rights and uses not specifically hereinafter reserved to the Grantor are to become vested in the United States of America, excepting from the operation of this easement ONLY those rights as may be specifically hereinafter reserved.

Provided, however, the above-granted right and easement shall not be interpreted or exercised to, in any way, interfere with the Grantor, its successors and assigns, erection, construction, maintenance, repair, rebuilding, respacing, replacing, operation, patrol and removal of electric transmission, distribution and communication lines consisting of suitable and sufficient poles and towers with sufficient foundations, together with wires strung upon and extending between the same for the transmission of electric energy and intelligence, together with all

BK1324 PG021

necessary fixtures, anchors, guys, crossarms, and other electrical equipment and appurtenances, or the clearing and keeping clear Tract 108-04 of all trees, timber and bushes growing on said tract only by such means as the Grantor, its successors and assigns, may select which do not interfere with the footpaths continuity or endanger hiker's passing along the footpath.

The Grantee and its assigns, agree that it will not erect or maintain any building or other structure, or authorize the erection or maintenance of any building or other structure, of any kind or nature, upon Tract 108-04, and will not place, or authorize any material of any kind or nature to accumulate on or be removed from Tract 108-04, any or all of which, in the opinion of the Grantor, its successors and assigns, would endanger or interfere with the operation or maintenance of said line or lines constructed along and across Tract 108-04.

This conveyance is subject to the terms and conditions of the Grantor's license from the Federal Energy Regulatory Commission designated as Project No. 2142, Indian Pond Project, including, but not limited to the Grantor's right to take reasonable remedial action to correct any violation of the terms and conditions of the license.

It is understood and agreed that no mechanized or motorized equipment or vehicles of any nature are allowed on the herein described property except in conjunction with such uses as may be specifically reserved, or for emergency purposes.



BK 1324 PG 022

The Grantor, for itself, its successors and assigns, covenants and agrees that ONLY the following uses are hereby reserved to itself, its successors and assigns, on the lands herein designated as Tracts 109-03/21.

The use of the above-described property for noncommercial, passive recreational purposes. It is understood and agreed that no structures are to be erected and no articles of personal property are allowed to be placed on the premises.

It is further understood and agreed that no mechanized or motorized equipment or vehicles of any nature are allowed on the herein described property except in conjunction with such uses as may be specifically reserved, or for emergency purposes.

THE GRANTOR, its successors and assigns, reserves the right to use the land described below in connection with the Wyman Project, Project No. 2329. This includes, but is not limited to, the right to use, lower and control the waters of the Kennebec River or any of its tributaries, as the Grantor, its successors or assigns, may see fit in its or their uncontrolled discretion without liability of any kind or nature on the part of the Grantor, its successors or assigns, to the Grantee and its assigns, and their licensees and permittees, for the uneven handling or control of said waters.

THE GRANTOR also reserves to itself, its successors and assigns, the perpetual right and easement to overflow and flood the interests described below, directly or indirectly by backflow, seepage, erosion, inundation or otherwise, as the same may be overflowed or flooded by the operation, control and discharge of the waters of the Kennebec River, or any of its tributaries, by means of any dam or dams owned or controlled



BK1324 PG023

by the Grantor, its successors and assigns, as the same are now or hereafter may be constructed across the Kennebec River, without liability on the part of the Grantor, its successors and assigns, to the Grantee, and its assigns.

This conveyance is subject to the terms and conditions of the Grantor's license from the Federal Energy Regulatory Commission designated as Project No. 2329, Wyman Project, including but not limited to the Grantor's right to take reasonable remedial action to correct any violation of the terms and conditions of the license.

The land in which the above interest and estate is conveyed is described as follows:

Tract 108-04

All that certain tract or parcel of land lying and being situated in Bald Mountain Township, T2, R3, B.K.P. E.K.R. and Caratunk Township, Somerset County, State of Maine, and being more particularly described as follows:

BEGINNING at a point on the western property line of subject owner, said point being a corner common to lands, now or formerly, of Skylark, Inc., and Scott Paper Company, and being located North 76° 04' 37" East, 56.89 feet from an iron pin and South 76° 04' 37" West, 7.55 feet from an iron pin, the first-mentioned iron pin being on the common property line between said Scott Paper and said Skylark; thence, with the property line of said Scott Paper, North 30° 29' 30" West, 627.90 feet to a point on the Bald Mountain, T2, R3, B.K.P. E.K.R./Caratunk Township Line, said point being located North 11° 20' 45" West, 34.78 feet from a stake and stones on said Township Line; thence, continuing with the property line of said Scott Paper, North 30° 29' 30" West, 610.21 feet to a point on the property line of said Scott Paper, said point being located South 42° 26' 08" West, 235.37 feet from an iron pin near utility pole number 179; thence, severing the land of subject owner, re-crossing said Township Line, North 68° 26' 00" East, 303.68 feet to a point on the property

## BK 1324 PG 24

line of other lands of said Scott Paper, said point being located South 63° 19' 40" East, 138.32 feet from said iron pin near utility pole number 179; thence, with the property line of said Scott Paper, South 30° 29' 30" East, 1,180.00 feet to a point on the westerly side of a Scott Paper Company gravel haul road; thence, continuing with the property line of said Scott Paper, crossing said road, South 30° 29' 30" East, 2,220.00 feet to another point on the property line of said Scott Paper; thence, again severing the land of subject owner, South 59° 30' 30" West, 300.00 feet to a point on the property line of the first-mentioned Scott Paper; thence, with the property line of said Scott Paper, in part with the property line of said Skylark, North 30° 29' 30" West, 2,209.00 feet to the point of beginning.

Containing 23.58 acres, more or less, of which 5.70 acres, more or less, lies within Joe's Hole.

The above-described parcel, designated as Tract 108-04, Appalachian National Scenic Trail, is a portion of the same land acquired by Central Maine Power Company from Hollingsworth and Whitney Company by deed dated October 22, 1954 and recorded October 27, 1954 in Deed Book 561, Page 466 and a portion of land acquired from Great Northern Paper Company by deed dated October 30, 1953 and recorded November 19, 1953 in Deed Book 554, Page 474. The above documents are of record in the Somerset County Registry of Deeds, State of Maine.

BEARINGS REFER TO MAINE STATE PLANE COORDINATE SYSTEM, WEST ZONE.

## Tract 109-03

All that certain tract or parcel of land lying and being situated in Lots 17 and 18 of Carrying Place Plantation, Township 1, Range 3, B.K.P., W.K.R., Somerset County, State of Maine, and being more particularly described as follows:

All that land lying East of the 580 foot contour line of the following described tract:

The North 1,000 feet of Lot 17, Range 1 and the South 1,000 feet of Lot 18, Range 1 of Carrying Place Plantation, Township 1, Range 3, B.K.P., W.K.R.

Containing 32.74 acres, more or less.

The above-described parcel, designated as Tract 109-03, Appalachian National Scenic Trail, is a portion of the same land acquired by Central Maine Power Company from Leona E. Sterling by deed dated August 10, 1959 and recorded August 28, 1959 in Deed Book 615, Page 76; is a portion of Parcel Two acquired from Oscar Clark, et al, by deed dated November 6, 1936

BK 1324 PG 025

and recorded in Deed Book 435, Page 389 and is a portion of the same land acquired from Central Securities Corporation by deed dated July 31, 1935 and recorded September 20, 1935 in Deed Book 434, Page 79, all documents are of record in the Somerset County Registry of Deeds, State of Maine.

## Tract 109-21

All that certain tract or parcel of land lying and being situated in Caratunk Plantation, Somerset County, State of Maine, and being more particularly described as follows:

BEGINNING at the northwest corner of the lot conveyed by Archie W. and Oscar H. Clark to Walter E. York by deed dated June 8, 1935, recorded Somerset Registry, Book 427, Page 24, which corner is also the southwest corner of the N. P. Brown lot, so called; thence south  $31^{\circ} 50'$  east along said Brown's southerly line about 320 feet to a post; thence south  $40^{\circ}$  east 97 feet to a post; thence south  $26^{\circ} 30'$  west to, and passing through, a post on the northerly bank of Pleasant Pond Stream about 846 feet to said Pleasant Pond Stream; thence westerly down said Stream to Kennebec River; thence northerly of Kennebec River to the point of beginning.

Containing 13.06 acres, more or less.

The above-described parcel, designated as Tract 109-21, Appalachian National Scenic Trail, is all of the same land acquired by Central Maine Power Company from Walter E. York by deed dated November 1, 1938 and recorded in Deed Book 445, Page 525, in the Somerset County Registry of Deeds, State of Maine.

THESE INTERESTS in land are being acquired for the National Park Service of the United States Department of the Interior.

SUBJECT to existing easements for public roads and highways, public utilities, railroads and pipelines.

TO HAVE AND TO HOLD the herein-described estates in land and rights unto the Grantee and its assigns forever.

THE SAID GRANTOR covenants that it has the right to convey such interests in land; that it has done no act to encumber the same; that the said Grantee shall have quiet and peaceful possession of the same, free and clear from any and all encumbrances; that it will warrant generally the estates in the land hereby conveyed; and that it, the said Grantor, will execute such further assurances of the said land as may be requisite.



BK 1324 PG 026

IN WITNESS WHEREOF, Central Maine Power Company, has caused this instrument to be sealed with its corporate seal and signed in its corporate name by Dustin W. Creamer, its duly authorized Asst. Vice President Administrative Services, and the same to be duly attested by William M. Finn, its Secretary, on this the day and year first above written.

SIGNED, SEALED AND DELIVERED  
IN THE PRESENCE OF:

CENTRAL MAINE POWER COMPANY

Mary M. Nolan  
WITNESS

Judith Sargent  
WITNESS

By: Dustin W. Creamer  
Assistant Vice President  
Administrative Services  
Attest: William M. Finn  
Secretary



CORPORATE SEAL

STATE OF MAINE )  
 ) ss.  
COUNTY OF KENNEBEC )

February 18, 1987

Then personally appeared the above named Dustin W. Creamer,  
Asst. Vice President  
its Administrative Services of Central Maine Power Company and  
acknowledged the foregoing instrument to be his free act and deed in his  
said capacity and the free act and deed of said corporation.

Before me,

A. E. Newell III  
Notary Public

My commission expires:

A. E. NEWELL III  
NOTARY PUBLIC, MAINE  
MY COMMISSION EXPIRES MAY 28, 1987



This deed was prepared by the National Park Service, Appalachian Trail  
Land Acquisition Office, Martinsburg, West Virginia. The precise name  
and address of the herein-named Grantee is: United States of America,  
Washington, DC 20240.

RECEIVED SOMERSET SS

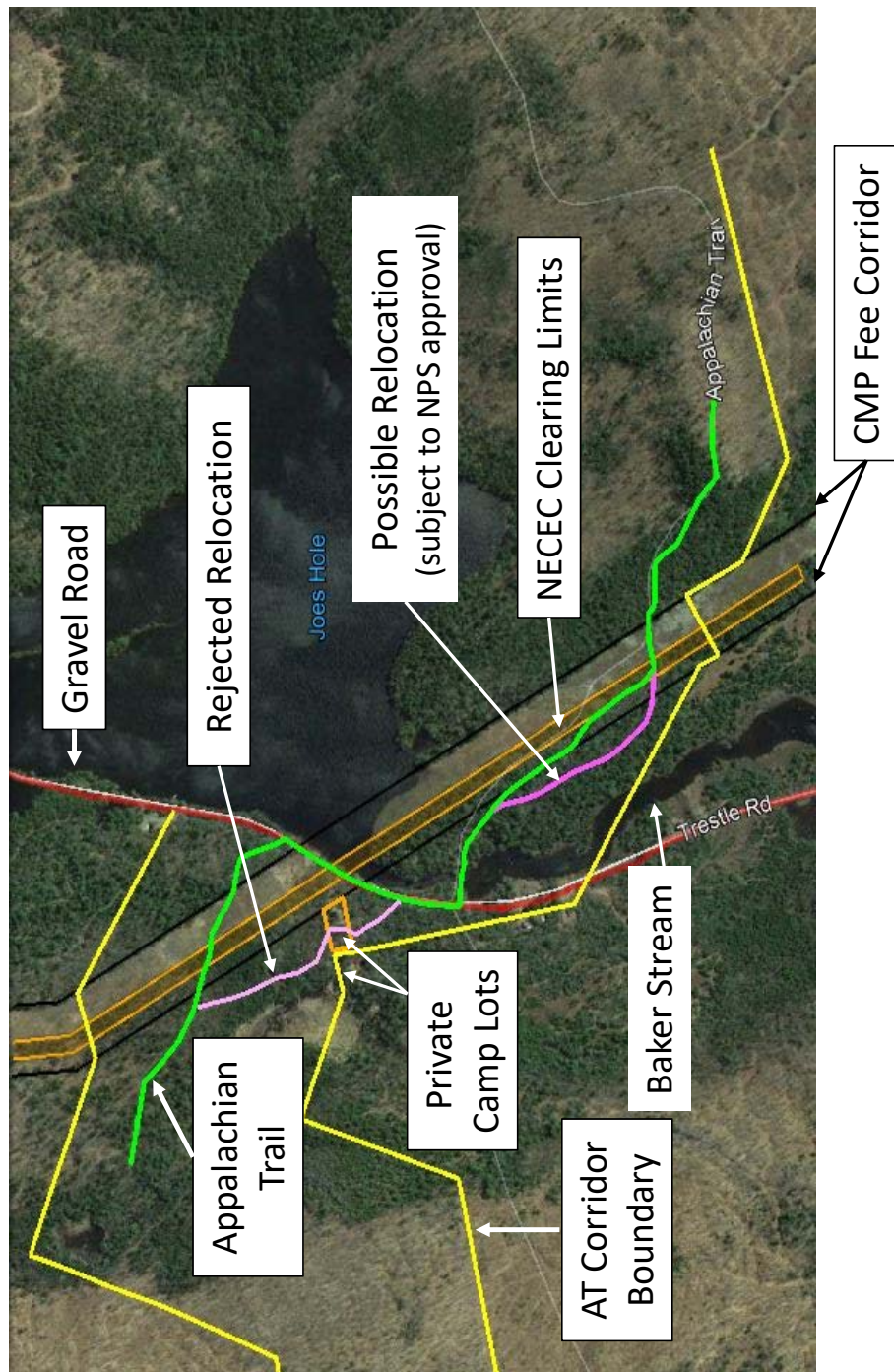
1987 FEB 18 PM 3:00

RECORDED FROM ORIGINAL



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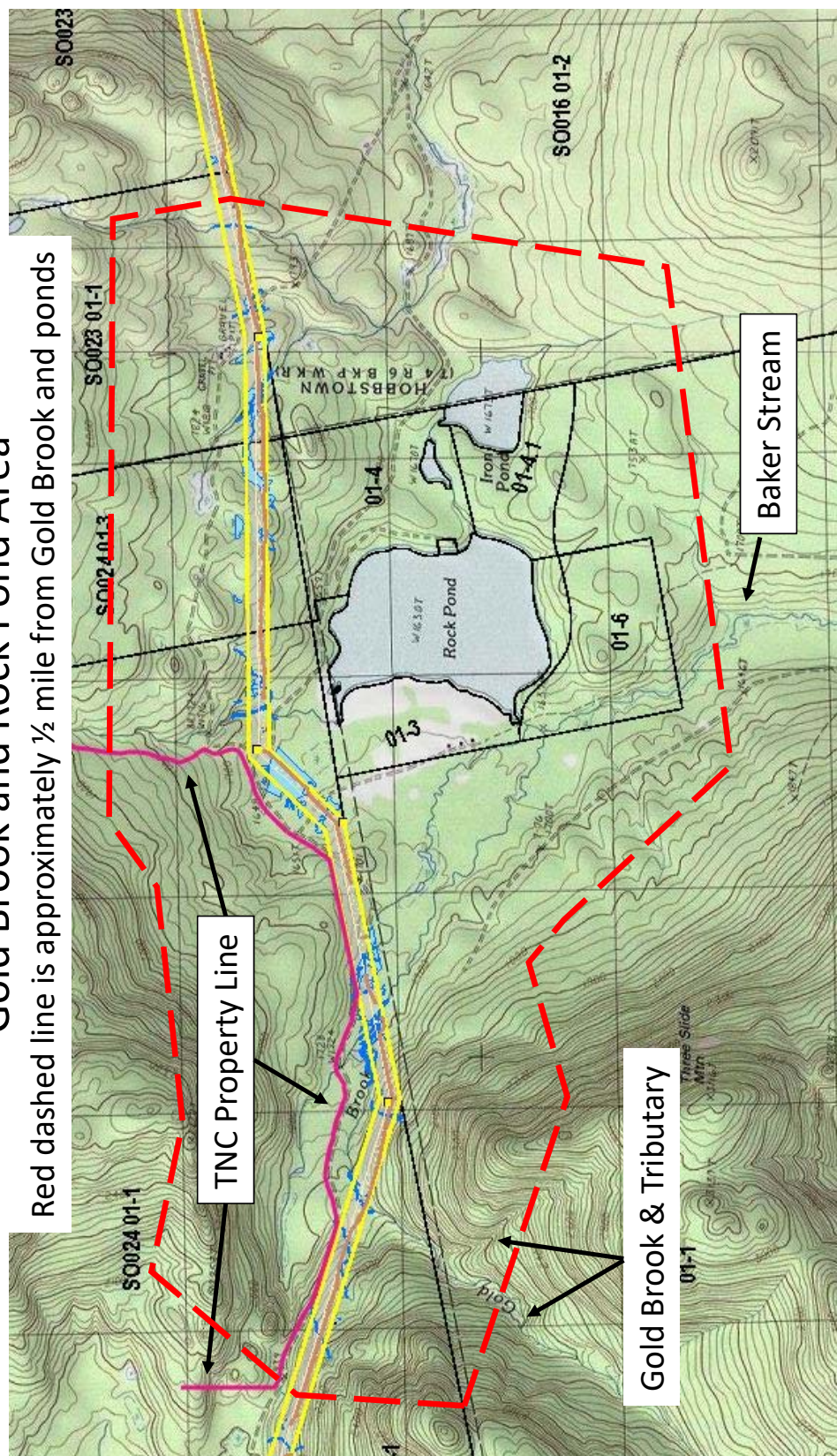
## Potential Appalachian Trail Relocations Caratunk & Bald Mountain Township, Maine







Red dashed line is approximately  $\frac{1}{2}$  mile from Gold Brook and ponds



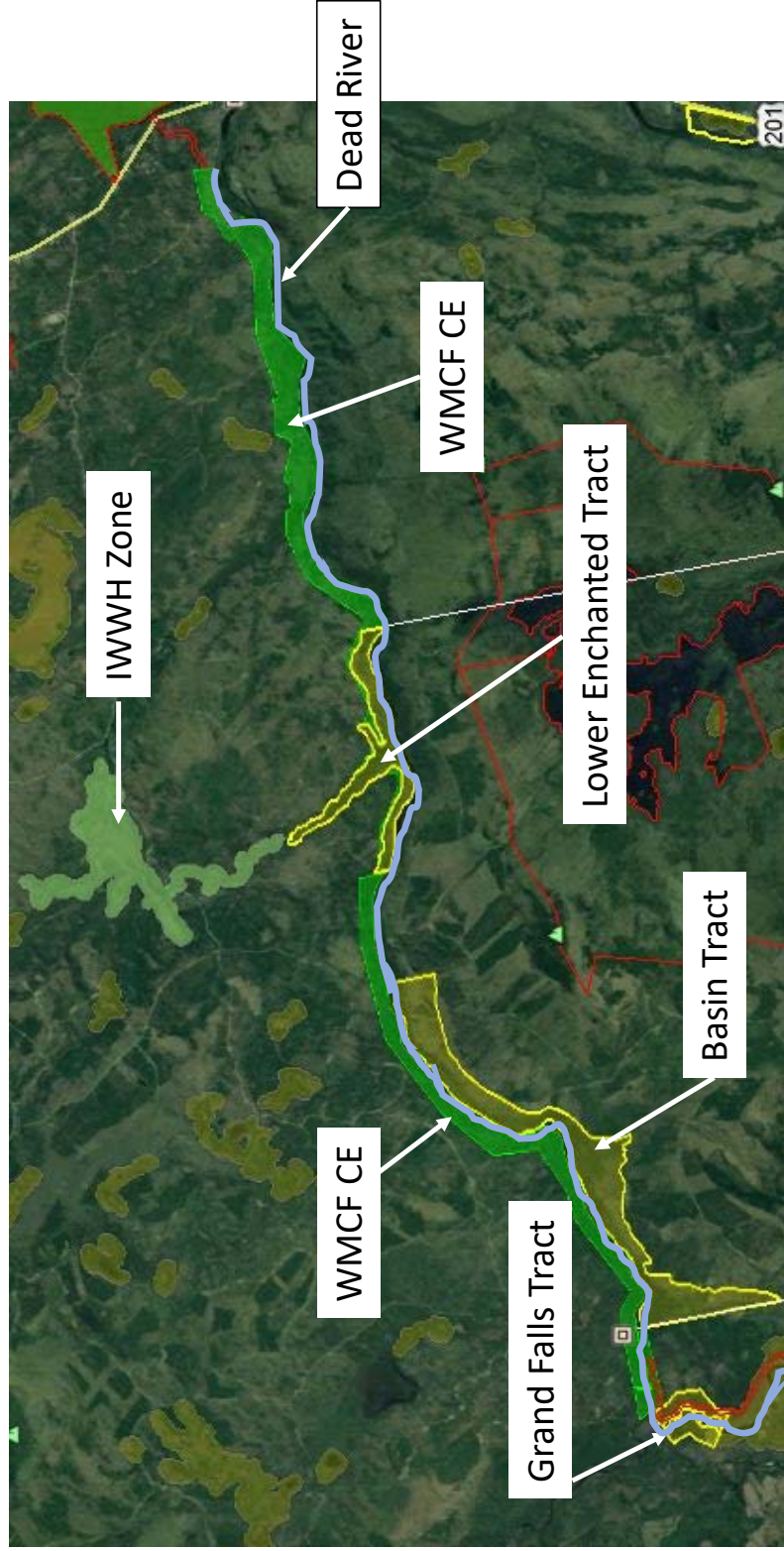




# Dead River Compensation Tracts

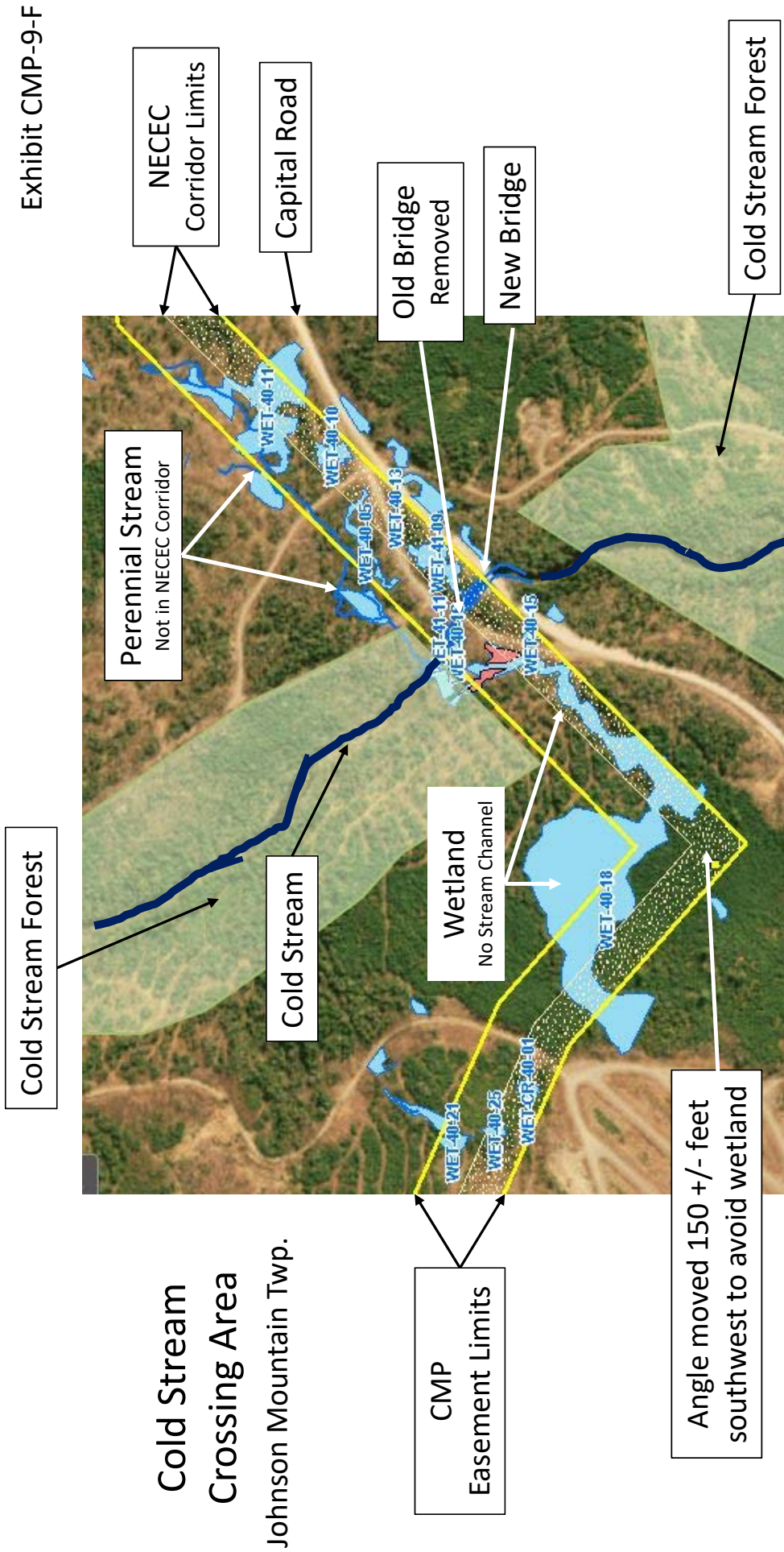
Spring Lake, Pierce Pond & Lower Enchanted Twp.

Exhibit CMP-9-E



5700

CMP-9-F



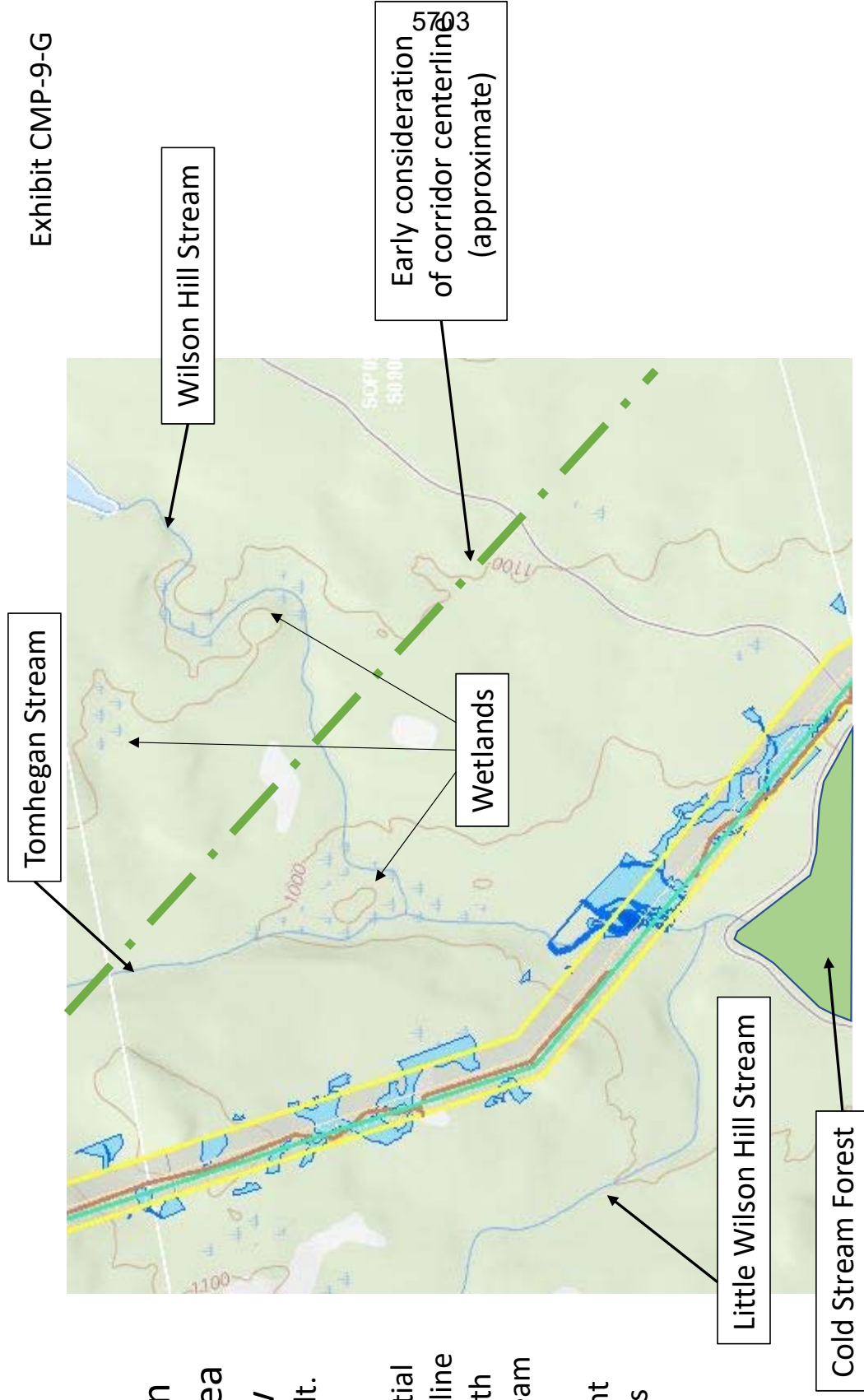




## Tomhegan Stream Area Overview

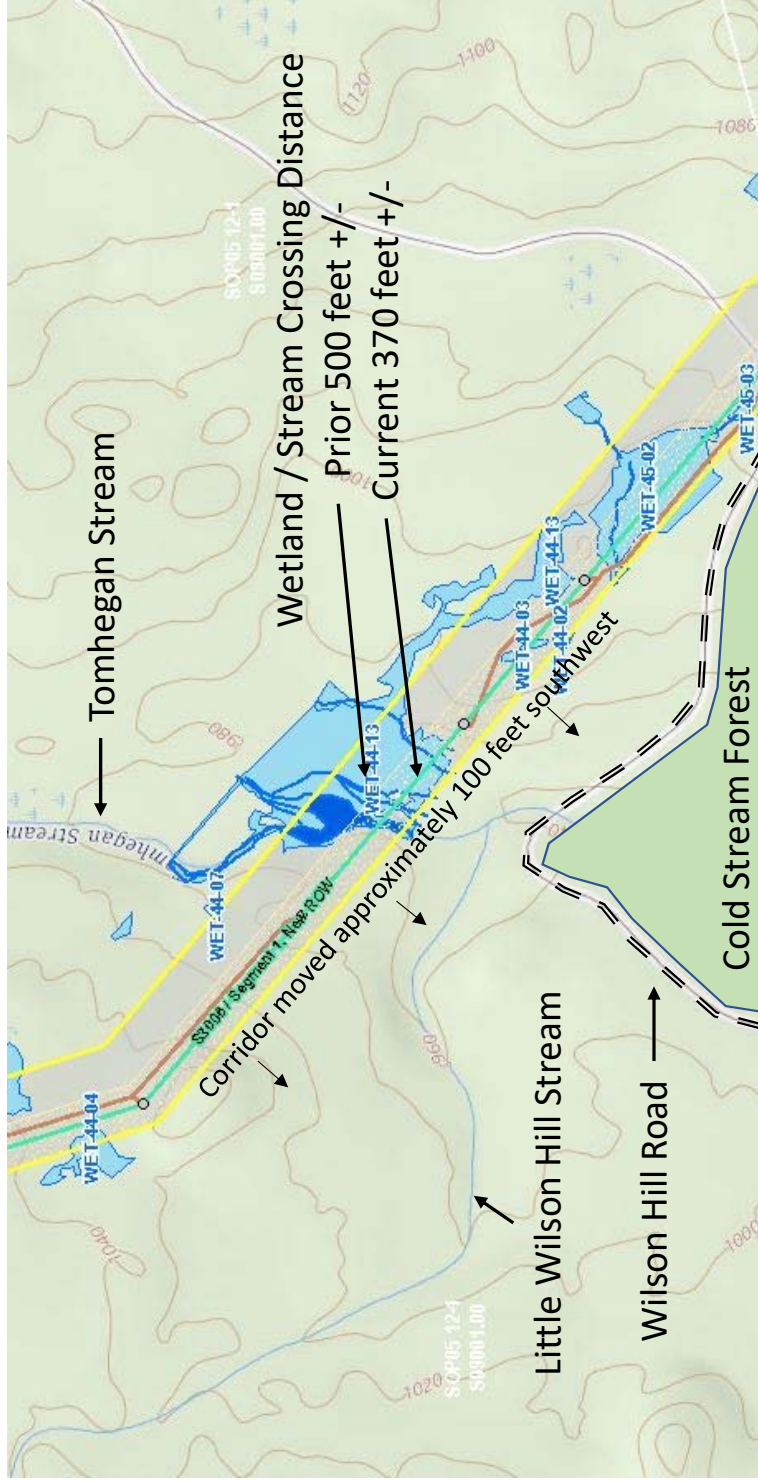
West Forks Plt.

An early potential corridor centerline would cross both Wilson Hill Stream and Tomhegan Stream. Current corridor crosses only Tomhegan Stream.





# Tomhegan Stream Crossing Detail West Forks Plt.







STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED REBUTTAL TESTIMONY AND EXHIBITS OF  
JUSTIN TRIBBET

March 25, 2019

Regarding

- Issue 3: Alternatives Analysis
  - Responsive to Intervenor Group 8 (NextEra) witness Christopher Russo
  - Responsive to Intervenor Group 2 (Town of Caratunk) witness Elizabeth Caruso

This testimony is in response to the direct testimony of Christopher Russo on behalf of NextEra Energy Resources (NextEra) and Elizabeth Caruso on behalf of the Town of Caratunk.

**I. Witness Qualifications (Relevant to DEP and LUPC Review)**

I am a Substation Design Engineer with a background in execution of energy projects and am the President at Engineering Leaders, Inc. I am currently the Engineering Manager for the New England Clean Energy Connect (NECEC) Project (Project). I graduated summa cum laude from the University of Maine at Orono with a Bachelor of Science in Electrical Engineering in 2006. Prior to starting Engineering Leaders, I worked in various engineering roles for over nine years at Central Maine Power Company, starting as an Associate Substation Design Engineer and ultimately as the Substation Engineering Manager. My CV is attached hereto as Exhibit CMP-10-A.

**II. Discussion (Relevant to DEP and LUPC Review)**

**A. THE FACT THAT OTHER PROJECTS PROPOSED DIFFERENT CONSTRUCTION METHODS DOES NOT MEAN THAT THOSE METHODS ARE A REASONABLY AVAILABLE SOLUTION FOR THE NECEC.**

Mr. Russo contends that because other projects proposed in the Northeast or completed around the world included underground or submarine cable, it must be reasonable for CMP to implement an underground solution. In particular he makes references to one project that Avangrid Networks considered in New York (Connect New York); two projects that were proposed in response to the Massachusetts 83D request for proposals to bring clean energy from Québec to New England (the New England Clean Power Link proposed by Transmission Developers Inc., which would be located in Vermont. and the Northern Pass transmission project proposed by an Eversource affiliate, which would be located in New Hampshire); and one project that was bid into the Connecticut Zero Emissions RFP (the Vermont Green Line transmission project proposed by a National Grid affiliate, which would be located in New York and Vermont). Three of these four projects also are cited by Ms. Caruso in her testimony, with similar arguments to those made by Mr. Russo.

The circumstances of those projects do not extend or apply to the NECEC. Mr. Russo's assertions ignore the following facts:

- There are site-specific reasons that an overhead line may not be appropriate in other situations, but is appropriate for the NECEC, given the very careful siting and design work performed to ensure that the NECEC Project would meet all applicable approval standards. Other projects have different siting and design considerations (e.g., federal parklands) and requirements that may make overhead lines unfeasible from a scenic, environmental, or cost perspective. It is not sufficient to simply say, "they did it, so CMP can and should do it, too." Each project is distinct with respect to setting, engineering constraints, cost considerations, and approval criteria.
- None of the other projects mentioned above has demonstrated that it is economically feasible. In fact, none of them has secured long-term transmission service agreements. For the two other projects cited above that participated in the Massachusetts 83D request for proposals, the fact that they were not able to secure long term contracts in that solicitation demonstrates that those projects would not fulfill their purpose which, similar to the NECEC as described in Mr. Berube's pre-filed direct testimony, is to deliver clean energy generation from Québec to New England at the lowest cost to ratepayers. The Vermont Green Line project, which was bid into the Connecticut Zero Emissions RFP, also failed to win that contract.

In short, the fact that these other cited projects proposed significant underground portions does not undermine the conclusion that undergrounding of additional portions of the NECEC is not a practicable or reasonably available alternative, as additional undergrounding would not allow the Project to meet its purpose. In fact, the NECEC Project has already absorbed nearly \$42 million in added costs from the DEP process alone, for the Kennebec River undergrounding



(at an incremental cost of \$31 million) and other environmental compensation and mitigation (nearly \$11 million), all additional to the original Project cost calculations.

Specifically, in several locations CMP has agreed to and proposed significant and costly design modifications to avoid and minimize impacts to protected and sensitive natural resources, including: 1) in Greene (Segment 3), rebuild of two existing co-located transmission line segments and redesign and relocation of a 1.5-mile segment of the new DC transmission line in this area to avoid tree clearing and associated impacts near a single occurrence of small whorled pogonia, a state-endangered orchid; 2) adjacent to Gold Brook (Appleton Township, Segment 1) and Mountain Brook (Johnson Mountain Township, Segment 1), increased structure heights to allow full height woody vegetation to remain within the conservation management areas of these streams to protect populations of Roaring Brook Mayfly (state threatened species) and Northern Spring Salamander (species of special concern); 3) In Moxie Gore and West Forks Plantation (Segment 1), retention of two natural winter deer travel corridors and maintenance of eight additional winter deer travel corridors within the transmission line right of way by selective vegetation management; and 4) in Parlin Pond Township (Segment 1), maintenance of 10- to 15-foot tall spruce fir within the transmission line corridor to protect the habitat of rusty blackbird (species of special concern). Numerous rare plant locations have also been avoided, or impacts to them minimized, by relocation of transmission structures and routing of access roads around them.

As part of the Maine Public Utilities Commission (PUC) settlement process the Project's costs have increased even further, as stated in Mr. Dickinson's rebuttal testimony. Additionally, as stated by Justin Bardwell in his rebuttal testimony, an underground solution may not be less damaging to the environment, including in the specific locations mentioned by Ms. Caruso,

given that the Project's current siting and design already avoid, minimize, and mitigate for its environmental impacts, even more now considering the design changes that have been implemented in many locations. CMP anticipated the sensitivity around the upper Kennebec River in developing the Project and modeled the potential undergrounding under the river as a contingency. Having made that change and the additional compensation measures discussed here (taller structures, tapering, in-lieu fees, etc.), CMP has exhausted the ability to incur additional costs without compromising the viability of the Project.

To demonstrate this point, I have developed a cost comparison table to illustrate the incremental Project cost for (1) undergrounding of the entire line utilizing the currently proposed route, (2) undergrounding of the entire line utilizing an alternative route, and (3) undergrounding only in the new 53.5-mile corridor portion utilizing the currently proposed route. The results are provided here (values in billions of USD unless otherwise noted):

| <b>Alternative Option</b>                      | <b>Overhead-(Baseline)</b> | <b>Underground-Proposed Route (Alternative)</b> | <b>Underground-Alternative Route (Alternative)</b> | <b>Underground-New 53.5-mile Corridor Proposed Route (Alternative)</b> |
|------------------------------------------------|----------------------------|-------------------------------------------------|----------------------------------------------------|------------------------------------------------------------------------|
| Existing Project Cost                          | 0.95                       | 0.69 <sup>1</sup>                               | 0.69 <sup>1</sup>                                  | 0.85 <sup>1</sup>                                                      |
| Alternative Underground Cost                   | 0                          | 1.88 <sup>2</sup>                               | 2.07 <sup>3</sup>                                  | 0.75 <sup>4</sup>                                                      |
| Overhead Mitigation Value Removed <sup>5</sup> | 0                          | -0.01                                           | -0.01                                              | -0.01                                                                  |
| <b>Total</b>                                   | <b>0.95</b>                | <b>2.56</b>                                     | <b>2.75</b>                                        | <b>1.59</b>                                                            |
| <b>Incremental Alternative Cost</b>            | <b>NA</b>                  | <b>1.61</b>                                     | <b>1.8</b>                                         | <b>0.64</b>                                                            |
| <b>Incremental Alternative Cost (%)</b>        | <b>NA</b>                  | <b>169%</b>                                     | <b>189%</b>                                        | <b>67%</b>                                                             |

<sup>1</sup> NECEC Existing Project Cost minus overhead portions that would be replaced with underground.

<sup>2</sup> See testimony of Justin Bardwell, Exhibit CMP-11-B.

<sup>3</sup> See testimony of Justin Bardwell, Exhibit CMP-11-D.

<sup>4</sup> See testimony of Justin Bardwell, Exhibit CMP-11-C.

<sup>5</sup> Overhead Mitigation Value Removed line item addresses the removal of the agreed upon overhead line mitigation costs noted above.

In addition, CMP's proposed overhead transmission line for the NECEC Project is consistent with existing transmission facilities throughout the state. CMP owns and operates over 2,800 miles of overhead transmission and only 16 miles of underground transmission, or 0.6%, most of it located in urban areas, mainly Portland. When properly and thoughtfully sited and designed, overhead transmission lines are a reasonable and accepted component of Maine's landscape.

**B. OVERHEAD HVDC TRANSMISSION LINES ARE COMPATIBLE WITH VSC HVDC CONVERTER TECHNOLOGY.**

Mr. Russo makes several assertions implying that Voltage Source Converter (VSC) technology is somehow incompatible with overhead HVDC lines. In fact, as part of the request for proposal process for the NECEC Project, multiple AC to DC converter vendors confirmed the engineering viability of the proposed NECEC design.

Mr. Russo references and provides incorrect and misleading statistics related to the number of above ground HVDC VSC transmission projects. For example: "CMP's HVDC vendor, Siemens, indicated that, between those projects that are already in-service or planned, only 1 out of 14 HVDC VSC transmission lines of any length are aboveground in the world."<sup>6</sup> In fact, there are at least two additional examples of such projects, in service or planned, that utilize VSC converter technology with overhead HVDC transmission lines.<sup>7</sup> CMP has extensive experience with similar AC transmission lines, and the Project design meets all engineering standards.

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<sup>6</sup> See page 3 of Pre-Filed Testimony of Christopher Russo.

<sup>7</sup> Maritime Link: <https://new.abb.com/systems/hvdc/references/maritime-link>

Caprivi Link: <https://new.abb.com/systems/hvdc/references/caprivi-link>

### **C. SNOWMOBILING CAN AND DOES OCCUR IN THE VICINITY OF OVERHEAD LINES.**

As noted above, CMP alone operates and maintains over 2,800 miles of overhead transmission lines and associated corridors in Maine. Throughout the state, overhead lines cross and are co-located with snowmobiles trails. Based on CMP's records, over 600 miles of snowmobile trail segments co-exists within CMP's existing overhead transmission corridors, approximately 22% of the snowmobile trail system (2,700+/- miles of the 12,000+/- miles of trails) in Maine involve some portion of CMP's existing transmission line corridors. There are just under 100 locations within CMP corridors where the Interstate Trail System (ITS) intersects or co-exists within CMP transmission corridors. In fact, in Ms. Caruso's own exhibit CRTK-9, Slide Number 2 ITS 87, has a segment of co-location within an existing CMP 34.5kV line corridor for approximately 0.8 mile, demonstrating further that co-location of snowmobiling and overhead line corridors can and already does exist while still maintaining this profitable tourism industry, as described in Ms. Caruso's testimony.

### **III. Conclusion (Relevant to DEP and LUPC Review)**

For the foregoing reasons, undergrounding of additional portions of the NECEC is not a practicable or reasonably available alternative, as additional undergrounding would not allow the Project to meet its purpose.

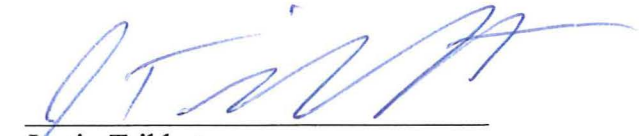
#### Exhibits:

Exhibit CMP-10-A: Tribbet CV



Dated: March 18, 2019

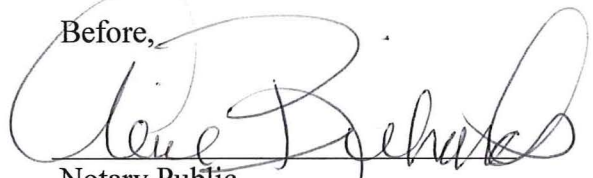
Respectfully submitted,

  
Justin Tribbet

STATE OF MAINE  
Kennebec, ss.

The above-named Justin Tribbet did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Dated: March 18, 2019

Before,   
Notary Public  
Name: Alice Richards  
My Commission Expires: Jan. 4, 2025





## Justin Tribbet, P.E.

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**Employment:** President at Engineering Leaders

**Experience:** 12 years of experience in power and control engineering, 9 years at Central Maine Power Company/AVANGRID

**Registration:** Professional Engineer in Maine

**Education:** Bachelors of Science in Electrical Engineering, University of Maine at Orono

### **Personal Skills**

- Engineering management (more than 20 employees across two states)
- Project scoping and estimating
- Owner's engineering
- Substation design
- Outage and construction sequencing
- Protection and control design
- Network modeling and protective relay settings
- Engineering studies and calculations
- Standards development
- Generator interconnections
- Utility operations and maintenance support
- Testing and commissioning
- Regulatory filings

### **Example Project Experience**

#### **Vineyard Wind Proposal - FERC 1000 Project | 2017**

Engineering support for onshore components of Vineyard Wind response to Massachusetts Clean Energy RFP (83C). Project scope included offshore wind turbine generators, offshore substation(s), submarine and onshore cables, onshore substation elements, and associated onshore network upgrades. Responsible for technical components of the expandable transmission elements of the bid including: scoping and estimating, RFP section 15 (expandable transmission) response, engineering drawing review and approval, and supporting transmission planning study process.

#### **New England Clean Energy Connect Proposal (NECEC) - FERC 1000 Project | 2016-2017**

Engineering lead for bid response preparation of HVDC transmission project in response to Massachusetts Clean Energy RFP (83D). Project scope included DC transmission and converter stations, 345kV AC interconnection, and associated network upgrades including addition of new STATCOM devices. Responsible for all technical aspects of the effort including: bid price input, budgetary bid specification creation and evaluation, operations and maintenance cost forecast,

RFP section responses, engineering drawings, loss calculations, and transmission planning process alternatives evaluation.

#### **Maine Clean Power Connection Proposal (MCPC) - FERC 1000 Project | 2016-2017**

Engineering lead for bid response preparation of transmission elements of a wind generator AC interconnection in response to Massachusetts Clean Energy RFP (83D). Project scope included 345kV AC transmission for wind collection as well 345kV AC interconnection and associated network upgrades including addition of new STATCOM devices. Project responsibilities similar to NECEC as noted above.

#### **AVANGRID 115/69kV Substation Design Library | 2017**

Project manager and engineering lead for implementation of a 115/69kV substation standard design template to be used for all four operating companies of AVANGRID. Project was completed on time and implemented a common physical drawing approach to be used for all future projects at AVANGRID.

#### **Maine Renewable Energy Interconnect Proposal (MREI) - FERC 1000 Project | 2015-2016**

Engineering lead for bid document preparation of transmission elements of a wind generator AC interconnection in response to Tristate Clean Energy RFP. Project scope included 345kV AC transmission for wind collection as well 345kV AC interconnection and associated network upgrades. Project responsibilities similar to NECEC as noted above.

#### **Coopers Mills 345kV STATCOM Addition | 2015-2016**

Owner's Project Engineer for scoping and EPC specification for a 345kV +/-200MVAR STATCOM. Project scope included the STATCOM addition and the necessary breaker and a half 345kV rung expansion at the existing Coopers Mills Substation. Responsible for STATCOM EPC specification development, technical review of bids and final qualification of STATCOM bidders, technical support for the STATCOM contract negotiation and 345kV rung expansion design to the issue for bid level.

#### **Waterville Winslow Area Upgrades- New County Road Substation | 2015**

Owner's Project Engineer during scoping phase. Project scope included a completely new 115/34kV substation to replace the existing Rice Rips Substation, additional 115kV transmission line and associated remote ends. County Road Substation scope included two 115kV line terminals, two 115/34kV power transformers, four 34kV line terminals, one 34/12kV power transformer and associated 12kV distribution circuits. Provided review and oversight for all required technical details for Maine Public Utility Commission (MPUC) filing as well as support for technical responses to oral data requests.

#### **New Gloucester Area Project (Lakes Region Phase 2) | 2015**

Owners Project Engineer supporting MPUC filing documentation. Project Scope included new and rebuilt 115kV and 34kV lines, New Gloucester greenfield substation with three 115kV line terminals, one 115/34kV power transformer, one 34kV line terminal, Webbs Mills Road greenfield substation with three 34kV line terminals, two 34kV capacitor banks, one 34/12kV power transformer and associated 12kV distribution circuits.

#### **FERC Brightline Project | 2015**

Owner's Project Engineer providing initial scope and estimate review of over 20 new and expanded substations ranging in voltage from 115kV down to 12kV.



### **Skowhegan Area Reinforcements- New Lakewood 115/34kV Substation | 2013-2014**

Owner's Project Engineer during conceptual phase. Project scope included a new 115kV line and a complete station rebuild in place with the final configuration including two 115kV line terminals (one new), two 115/34kV transformers (one new), four 34kV line terminals, and one 34kV capacitor bank. The project also included remote end relay upgrades. Provided subject matter expert testimony during the regulatory proceeding at the MPUC regarding the project scope and cost development.

### **Capitol Street Hydrogen Fuel Cell Pilot | 2013-2014**

Project Manager and Project Engineer for all phases of the project through scoping to closeout. Project scope included installation of a 24 and 48VDC proton exchange membrane fuel cells for the purposes of extended battery backup during a prolonged AC outage. Performed programming and setup of fuel cell devices onsite.

### **New Searsport 34/12kV Substation | 2013-2014**

Owner's Project Engineer completed conceptual engineering and detailed engineering RFP, supported owner reviews through a majority of the engineering effort. Project scope included one 34kV line terminal, one 34/12kV power transformer and two 12kV distribution lines.

### **Guilford 34kV Capacitor Bank Addition and Station Rebuild | 2013**

Outage Coordination, construction sequencing and temporary substation design largely on wood poles for Guilford project. Temporary substation design scope included one 115kV line terminal, one 115/34kV power transformer, four 34kV line terminals, one 34kV capacitor bank, one 34/12kV power transformer and associated 12kV distribution circuits.

### **New Woolwich 34/12kV Substation | 2013**

Owner's Project Engineer completed conceptual engineering and detailed engineering RFP. Project scope included one 34kV line terminal, one 34/12kV power transformer and two 12kV distribution lines.

### **New Mobile Substations | 2012-2015**

Owner's Project Engineer for all phases of mobile project including scoping, detailed design and procurement. Project scope over the years included four mobile units with unique design challenges. Mobile #12 design included a single 115kV line termination, 34 or 12kV line termination and 115/34 or 12kV power transformers with associated SF6 circuit breakers and relay protection. Mobile #13 design included a 34kV or 12kV Gas Insulated Switchgear (GIS) with five line terminal positions. Mobile #14/15 were sister units each with one 34kV and one 12kV GIS buses supporting: one 34kV line terminal, one 34/12kV power transformer, three 12kV line terminals. After project was over provided ongoing support for mobile procurement at other operating units at AVANGRID.

### **Mason Substation Breaker Replacement and Protection and Control Upgrade | 2011-2012**

Owner's Project Engineer for engineering and construction phases of the project. Project scope included replacement of seven 115kV circuit breakers and a control system migration from a retired power plant to a new control house.

### **Asset Management Breaker Replacements | 2011-2012**

Owner's Project Engineer through entire project. Project scope included four power transformers, both 115/34kV and 34/12kV, and fifteen breaker replacements at 115/34kV voltage levels.

### **Spruce Mountain Generator Interconnection | 2010-2011**

Owner's Project Engineer through entire project. Project scope included a new 34kV distribution line and associated termination at the existing Woodstock 115/34kV Substation. Performed review and oversight of collector substation design and commissioning efforts.

### **Section 241 New 115kV Line- Wyman Hydro Terminal Upgrade | 2010-2012**

Owner's Project Engineer through entire project. Project scope included one 115kV line terminal and associated protection and control upgrades including a major control house expansion at Wyman Hydro and associated remote end work at Heywood Road Substation.

### **Park Street- 115/34kV Transformer Replacement | 2009-2010**

Owner's Project Engineer through entire project. Project scope included a replacement 115/34kV power transformer and new 115kV circuit switcher.

### **Kibby Wind Generator Interconnection | 2008-2009**

Owner's Project Engineer through detailed engineering, construction, commissioning and closeout. Project scope included a complete brownfield rebuild of Bigelow Substation with three 115kV line terminals (one new), one 115/34kV power transformer and associated 34kV distribution circuits. In addition, one 115kV line terminal and two 115kV capacitor banks were added at the existing Wyman Hydro Substation, an existing 115kV line section was re-rated and 34kV capacitor banks were installed at three brownfield substations. In addition to role as project engineer performed review and oversight of generator collector substation design and commissioning efforts.

### **Heywood Road – New 115kV Substation | 2008-2009**

Owner's Project Engineer for construction, commissioning and closeout. Project scope included a new 115kV breaker and a half substation with four line terminals and one 115kV capacitor bank and various remote end relay and fault duty upgrades. Performed detailed modifications of relay settings files, participated in relay testing and end-to-end commissioning onsite. In addition, self-performed all aspects of design related to two circuit switcher upgrades including a custom electrical design and commissioning upgrades onsite.

### **New 115/34kV Woodstock Substation | 2008-2009**

Commissioning Assistant during test phase of the project effort. Project scope included a new 115/34kV substation including four 115kV line terminals, two 115/34kV power transformers, three 34kV line terminals and one 34kV capacitor bank.

## **Work Experience**

### **President | Engineering Leaders | January 2018 to Present | Richmond, Maine**

- Responsible for all commercial and technical functions of the company

### **Manager of Substation Engineering | AVANGRID | June 2014 to January 2018 | Augusta, Maine**

- Responsible for all of substation engineering at former Iberdrola USA operating companies of AVANGRID (Rochester Gas and Electric, New York State Electric and Gas and Central Maine Power Company).
- Responsible for management over 20 total engineers spread across two states and three operating companies
- Member of ISO-NE System Design Task Force

### **Supervisor of Substation Engineering | Central Maine Power/Iberdrola USA | July 2010 to June 2014 | Augusta, Maine**

- Duties similar to manager above except limited to CMP

### **Associate Engineer (Projects) | Central Maine Power | October 2008 to July 2010 | Augusta, Maine**

- See sample project assignments above

### **Test Director/Work Control Representative | Portsmouth Naval Shipyard (US Navy nuclear submarine overhaul facility) | May 2006 to October 2008 | Kittery, Maine**

- Responsible for onboard commissioning of non-nuclear systems on the Los Angeles class submarines for US Navy, in addition participated onboard three sea trials events
- Responsible for tag out of non-nuclear electrical and mechanical systems to allow work to commence





STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED REBUTTAL TESTIMONY AND EXHIBITS OF  
JUSTIN BARDWELL

March 25, 2019

Regarding

Issue 3: Alternatives Analysis

- Responsive to Intervenor Group 8 (NextEra) witness Christopher Russo
- Responsive to Intervenor Group 2 witnesses Elizabeth Caruso, Justin James Presiendorfer, and Garnett Robinson
- Responsive to Intervenor Group 6 Witnesses Rob Wood, Andrew Cutco, and Bryan Emerson

This testimony is in response to the direct testimony of Christopher Russo on behalf of NextEra Energy Resources (NextEra), and portions of the direct testimony of Elizabeth Caruso, Justin James Presiendorfer, Garnett Robinson, Rob Wood, Andrew Cutco, and Bryan Emerson relating to installation of portions of the NECEC Project transmission line underground.

## **I. WITNESS QUALIFICATIONS (RELEVANT TO DEP AND LUPC REVIEW)**

I am the Manager for Underground Transmission at Black & Veatch. I am currently engaged as the Technology Consultant for Underground Transmission for the New England Clean Energy Connect (NECEC) Project (Project). I graduated from Kansas State University with a Bachelor of Science in Electrical Engineering in 2005. I have been employed as an engineer or engineering manager for underground and submarine transmission for Black & Veatch since 2005. I attach my CV as Exhibit CMP-11-A.

## **II. DISCUSSION (RELEVANT TO DEP AND LUPC REVIEW)**

Christopher Russo, Elizabeth Caruso, Justin James Presiendorfer, Garnett Robinson, Rob Wood, Andrew Cutco, and Bryan Emerson have provided testimony to the Department of Environmental Protection (DEP) and the Land Use Planning Commission (LUPC) that asserts that during the planning of CMP's Project there was a "failure to consider undergrounding the New England Clean Energy Connect ("NECEC") high voltage direct current ("HVDC") transmission line."<sup>1</sup> Furthermore, Mr. Russo asserts that "Failure to evaluate an undergrounded the [sic] HVDC transmission line means that CMP has failed to establish that 'there is no alternative site which is both suitable to the proposed use and reasonably available to the

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<sup>1</sup> See page 2 of Pre-Filed Testimony of Christopher Russo.

applicant' as required for portions of the NECEC Project within the Commission's P-RR subdistrict."<sup>2</sup> Mr. Russo and the other witnesses are mistaken.

In fact, the proposed overhead HVDC transmission line is consistent with all applicable statutes, regulations, and standards, including those that apply within the LUPC's P-RR (Recreation Protection) subdistrict. After a thorough review, CMP determined that undergrounding any additional segments of the NECEC transmission line is not a practicable, or a suitable or reasonably available alternative, due to the extremely high cost, limited environmental benefits, increased risk and impacts during construction, and potential adverse operational impacts. It was so clear that undergrounding would not meet the Project purpose or otherwise be practicable, suitable, or reasonably available, in fact, that CMP did not initially include it as an alternative in the application materials filed with DEP and LUPC.

#### **A. DESCRIPTION OF UNDERGROUND ALTERNATIVES**

To respond to the specific points raised by the witnesses identified above, a summary of underground transmission methods, potential alternate routes, estimated costs, anticipated environmental and public impacts, and additional risk during construction are provided below.

##### **1. Construction Methods**

In order to meet the power transfer and reliability requirements for the Project an underground installation would require two cables per pole, with an installed spare, for a total of five polymer insulated power transmission cables and two fiber optic cables. (In specific areas with limited trenchless installations a single cable per phase is sufficient to meet the load, but to connect two cables per pole to one cable per pole requires construction of above grade terminal

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<sup>2</sup> See page 2 of Pre-Filed Testimony of Christopher Russo.

stations; construction of terminal stations would have significant additional cost and natural resource impacts.) The cables are limited to approximately 2,500-foot shipping lengths, requiring the cables to be jointed or spliced approximately every 2,200 feet. Jointing the cable requires weather- and humidity-controlled enclosures. Installing the entire line underground would require an estimated 390 jointing locations with five joints at each location.

**a. Direct Burial**

The lowest cost underground installation method is direct burial. In this type of installation, a trench the full length of the cable shipping length is opened using an excavator. In areas with shallow bedrock, trenching will require blasting, hoe ram, or similar excavation methods. The cables are placed in a single row in a sand bedding layer approximately one foot deep in the bottom of the trench. Above the sand bedding layer a protective concrete slab would be poured and the trench above the slab would be backfilled with native soil. A typical trench would be approximately five feet wide at the bottom with sloping sides for a minimum surface width of 12 feet, increasing when trench depth increases. The cables would be installed with a minimum depth of 60 inches to the top of bedding layer for a minimum depth of six feet to the bottom of the trench. In areas where the cable crosses other below ground infrastructure the cable would need to be deeper.

At each jointing location a large excavation, approximately 60 feet long, 20 feet wide, and seven feet deep would be opened. A concrete pad would be poured in the bottom of the excavation. Temporary structures would be erected over the jointing locations. Once the cables have been jointed, precast concrete enclosures approximately 12 feet long and 4 feet wide would be placed over each joint for additional protection and the jointing pit would be backfilled with sand and native soil.



The direct burial installation method requires several thousand feet of trench and a clear work area approximately 75 feet wide to stay open while the cable is installed and jointed. This generally makes direct burial unsuitable for installation within roadways due to the impacts to users of the road, large installation area, and insufficient protection from damage due to future utility or road construction.

Excavation would require management and disposal of the spoils excavated from the trench. Only part of the excavated soil would be returned to the trench. During excavation temporary stockpiles would be maintained beside the trench and spoils not able to be reused as backfill would require disposal off site. Stockpiles would need to be stabilized and protected to prevent erosion and sedimentation.

**b. Concrete Encased Duct Bank**

In roadways, shared right-of-way, or other exposed areas cable systems are typically installed in concrete encased duct bank. In this type of installation, several hundred feet of trench is opened using an excavator. In areas with shallow bedrock, trenching would require blasting, hoe ram, or similar excavation methods. Polyvinyl Chloride (PVC) conduits would be installed using spacers in the bottom of the trench, and concrete would be used to encase the conduits. Above the concrete the trench would be backfilled and topped with pavement.

Duct bank would include five conduits for the power cables, two conduits for the fiber-optic cables, and one spare conduit installed in two rows of four conduits. The trench would be approximately five feet wide. Trenches for duct bank are typically shored, keeping the width the same at the top and bottom. The duct bank would be installed with a minimum of 60 inches to the top of the concrete encasement. The encasement would be approximately two feet deep for a

minimum trench depth of eight feet. In areas where the cable crosses other below ground infrastructure the cable would need to be deeper.

At each jointing location a pair of precast jointing bays, approximately 33 feet long, 10 feet wide, and 10 feet deep (roughly the size of a school bus) would be buried. The jointing bays would be buried completely, with access provided by two 30-inch manhole entries per vault. Additional smaller handholes, approximately two feet wide by four feet long, would be required for the installation of the fiber optic cables at the jointing locations.

Duct bank construction typically requires a 30-foot wide work area along with space for an access road. At the jointing locations the work area would need to be approximately 10 feet wider to allow for installation of the jointing bays.

Excavation would require management and disposal of the spoils excavated from the trench. Only a portion of the excavated soil would be returned to the trench. During excavation temporary stockpiles would be maintained beside the trench and the spoils not able to be reused as backfill would require disposal off site. Stockpiles would need to be stabilized and protected to prevent erosion and sedimentation.

Once the duct bank system is complete the cable would be pulled into the duct bank system from the jointing bays. Cable installation does not require re-excavating at the jointing bays. The cable would then be jointed in the vaults.

**c. Trenchless Installation**

In areas where surface obstacles such as highways, railroads, sensitive wetlands, or waterways would prevent installation by direct buried or trenched duct bank, trenchless installation methods such as Horizontal Directional Drilling (HDD) can be used. While there are other trenchless methods available, HDD is the lowest impact trenchless method for the

conditions present on the NECEC Project. Trenchless installation methods are two to 10 times more expensive than trenched installations, and trenchless installation methods are susceptible to disruption due to variable, unfavorable, and unexpected subsurface conditions such as rock, boulders, or cobbles. As discussed below, trenchless installation for the Project is expected to be at the higher end of the cost range due to access constraints, subsurface conditions, and required site preparation.

HDD uses a guided drill rig to open a pilot bore 8 to 12 inches wide. Additional passes with progressively larger reamers would be used to enlarge the hole to the diameter required to install the pipe (conduit) bundle into the borehole.

Drilling fluid, primarily a combination of water and bentonite clay, is used to lubricate the drill, stabilize the sides of the borehole, and carry the cuttings out of the borehole. Bentonite clay is a naturally-occurring non-toxic mineral. The drilling fluid is captured at the borehole entry and exit points, filtered/cleaned, conditioned, and re-used as much as possible.

Once the borehole is open and stable, a bundle of fused or welded pipe would be pulled into the borehole by the drilling machine. For shorter crossings the pipe would be high-density polyethylene (HDPE) heat-fused into a single length. On longer crossings with higher installation forces fusible PVC pipe may be used. The displaced drilling fluid is contained and disposed of off-site.

The HDD operation will require a temporarily-cleared work area on each side to the obstacle, approximately 100 feet wide and 250 feet long. The pipe to be pulled into the HDD would need to be assembled into a single string in a clear, mostly straight area the length of the crossing and approximately 30 feet wide.

All drilling fluid solids (bentonite clay) and cuttings will be contained and settled in tanks or sediment traps, which will be disposed of at an approved facility. Water used in the drilling fluid would be recovered and reused during HDD operations after filtering out cuttings. Surplus drilling water would be properly disposed of. To prevent “inadvertent returns,” which occur if drilling fluids leak through an unidentified weakness, or fissure or fractures in the soil or underlying rock, CMP will implement a drilling fluid management plan such as described in the “Requirements for Inadvertent Fluid Release Prevention, Monitoring, and Contingency Plan for HDD Operations” for the upper Kennebec River HDD crossing, filed with the DEP on October 19, 2018.

HDD installations would typically be connected by duct bank to nearby joint bays before continuing as either duct bank or direct buried installation.

**d. Termination Stations**

When transitioning between overhead and underground transmission, termination stations will be required to terminate the underground cable and connect to the overhead lines. Termination stations for this Project would be approximately 135 feet square and include overhead line dead-end structures, surge arrestors, and termination stands. These stations would appear similar to a substation, with fencing and aggregate pavement surfacing, and on the majority of the route, including the upper Kennebec River crossing, the termination stations would include structures approximately 95 feet tall. In areas where increased structure height is being used to minimize clearing area the termination station structures would be taller, up to 170 feet in some areas.

Routing the cable up a monopole structure and mounting the cable terminations on the structure as is done at lower voltages would not be acceptable for this installation due to the size

and weight of the cable terminations and difficulty in conducting maintenance and repair work due to the height of the transmission structures.

## **2. Description of Current Route**

Starting from the HVDC Converter Station in Lewiston, Maine the route heads north following the overhead transmission line right-of-way (ROW) for approximately 92 miles. The route crosses State highways 133, 17, 156, and 148, many secondary roads, and many waterways and wetlands. From East Moxie Township the route runs east-west for approximately 53 miles before reaching the Canadian border. Underground construction using the current route would be expected to be mostly direct burial with HDD installations used for major highway, waterway, and wetlands crossings.

## **3. Description of Alternate Underground Route**

To evaluate a lowest environmental impact alternate specific to underground construction methods an alternate route has been developed revising the northern portion of the line to minimize additional clearing. This alternate route seems to be similar to the one described by Ms. Elizabeth Caruso but it has been modified to meet the border crossing location agreed to with Hydro Quebec Transenergie.

Starting from the HVDC Converter Station in Lewiston, the route heads north following the overhead transmission line right-of-way (ROW) for approximately 89 miles. Construction in this section would be expected to be mostly direct burial with HDD installations used for major highway and waterway crossings. The route crosses State highways 133, 17, 156, and 148, many secondary roads, and many waterways and wetlands. From East Moxie Township the route follows State Rt. 201 before turning west along Spencer Rd. for a total of 59 miles before reaching the Canadian border. The construction method in the roads would be concrete encased duct bank with several HDD crossings.



The alternate route relies heavily on State Rt. 201 and Spencer road. CMP has not had discussions with the Maine Department of Transportation (MDOT) about installing duct bank in highways, but in general installations requiring manhole entries are not permitted within existing or potential travel lanes of highways in Maine.<sup>3</sup> Thus MDOT is unlikely to permit this installation, but it is possible a waiver or expansion within the road ROW could be obtained.

Spencer road is a privately-owned road. The owner of this road has stated opposition to installations within the travel lanes of the road due to the impacts it may have on operating and maintaining the roadway.<sup>4</sup>

#### **4. Estimated Costs for Underground Line Construction**

Installing transmission lines underground is much more expensive than overhead. During the Public Utilities Commission (PUC) proceeding on the Certificate of Public Convenience and Necessity (CPCN) for the NECEC Project, CMP witness Mr. Christopher Malone testified that the cost of undergrounding is “roughly three to four times the cost of overhead.”<sup>5</sup> Additionally, during the PUC proceeding NextEra’s own expert witness Mr. Dan Mayers acknowledged the substantial costs of burying transmission line.<sup>6</sup>

This significant cost factor is further supported by “Overall Cost Comparison Between Cable and Overhead Lines,” by Robert Benato and Domenico Napolitano, published in *Electra*, dated December 2012. In that study, the minimum incremental costs are shown to be about three

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<sup>3</sup> Maine Department of Transportation, Utility Accommodation Rules, Section 10, Page 47.

<sup>4</sup> Kenneth Freye Rebuttal, March 21, 2019.

<sup>5</sup> See footnote 181 on page 61 of CMP’s PUC Reply Brief at: <https://mpuc-cms.maine.gov/CQM.Public.WebUI/Common/CaseMaster.aspx?CaseNumber=2017-00232>

<sup>6</sup> See page 61 of CMP’s PUC Reply Brief at: <https://mpuc-cms.maine.gov/CQM.Public.WebUI/Common/CaseMaster.aspx?CaseNumber=2017-00232>

times more for underground installation compared to overhead installation based on direct burial; costs for undergrounding can be higher depending on the project complexity.

The preceding sources are based on general information. To better characterize the impacts on the NECEC Project in this specific case Black & Veatch on behalf of CMP has prepared conceptual level estimates for installing the line underground on the proposed route and an alternate underground route that uses existing overhead corridor and existing roadways as much as possible. To install the line underground on the proposed route would cost approximately \$1.9 billion.<sup>7</sup> To install the 53.5-mile new corridor portion of the Project underground along the proposed route would cost approximately \$750 million.<sup>8</sup> To install the line underground on the alternate route would cost approximately \$2.1 billion.<sup>9</sup> This is approximately 5 to 7 times the expected cost of overhead transmission construction.

These are preliminary estimates and do not include costs for the convertor station, interconnecting lines, upgrades to other transmission and substation assets, and indirect costs such as CMP and Avangrid personnel. Total project cost for installing the Project with underground lines would be \$2.6 billion on the current route or \$2.8 billion on the alternate underground route, approximately three times the currently estimated Project cost. The total project cost for constructing the new corridor portion of the proposed route underground, as noted above, would be \$1.6 billion.

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<sup>7</sup> Underground Cost Estimate, Proposed Route, attached as Exhibit CMP-11-B.

<sup>8</sup> Underground Cost Estimate, New Corridor Only, attached as Exhibit CMP-11-C.

<sup>9</sup> Underground Cost Estimate, Underground Alternate Route, attached as Exhibit CMP-11-D.

## **5. Environmental Impacts**

Underground transmission installations have different impacts from overhead transmission. Specific impacts are heavily dependent on the protected and sensitive resources present at specific locations. Underground transmission requires less clearing width than overhead transmission, but still requires a significant area to be cleared. For the NECEC Project a width of 150 feet is required for overhead lines and 75 feet is required for underground lines. In addition, the surface disruption caused by underground transmission line construction is continuous along its length rather than intermittent at each overhead structure installation location. The additional surface disruption will require additional control measures for soil erosion, sedimentation, and dust generation during construction, and poses a risk that those control measures could be damaged during an extreme weather event.

Clearing width for overhead transmission is determined based on electrical clearances and vegetation management. In underground transmission applications, clearing width is determined based on a combination of maintenance operation requirements, preventing damage due to root growth, and preventing future vegetation impacts to line capacity. In both installations shorter vegetation is not a concern.

Maintenance and repair of underground transmission lines requires access to every jointing location along the route. This requires permanent access roads to be maintained to each jointing location. Typically these access roads follow the right-of-way, but the roads may need to route around surface obstacles such as protected or sensitive natural resources like wetlands and streams. For overhead lines, permanent access roads to each structure are not normally required. CMP typically maintains permanent access roads every few miles with temporary matting being used for repair work. The inspection and potential maintenance and repair requirements for underground installations require permanent access to each jointing location.

Preventing damage due to root growth and preventing future impacts to the line capacity of underground transmission lines are both driven by the roots of large trees. The roots of large trees will remove moisture from the soils and under drought conditions can increase the thermal resistance of the soils, causing an unacceptable temperature rise in the cables. While it varies with the species of tree, most trees have a root area of impact similar to the crown spread (drip-line) of the tree. Maine has several species of trees with crown spreads exceeding 70 feet.<sup>10</sup>

Surface disruption during construction for overhead transmission includes access roads and work sites at each structure, with minimal impacts between structures. Surface disruption during construction for underground transmission is continuous and at the full 75-foot wide work area unless higher cost and higher risk trenchless methods are used.

Overhead lines can generally avoid or minimize direct wetland impacts by locating structures outside of wetlands. Underground transmission installation being continuous can only avoid wetlands and waterways by using higher cost and higher risk trenchless methods.

## **6. Impacts to the Public**

In general, impacts due to construction of underground transmission lines will have a larger impact on the general public than overhead transmission lines. This is particularly significant when the line is being installed in public roadways.

Underground transmission line construction in roadways will have significant impacts to the public. Most of the roads in the Project area are two lane roads. Underground construction would require closure of half the road, resulting in alternating one-way traffic.

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<sup>10</sup> Forest Trees of Maine, Maine Department of Agriculture, Conservation and Forestry.

Underground transmission line construction is slower than overhead construction with significantly more construction activity along the route. Construction at each splicing location would require 2-3 weeks of continuous activity. Direct buried cable sections would require continuous work along the 2,200-foot-long trench for approximately three weeks. Duct bank construction would advance at approximately 200 feet per day. HDD operation duration would depend heavily on the subsurface conditions and length of the crossing, with each drilling location being occupied 8 to 24 weeks.

## **7. Additional Risks During Construction for Underground Lines**

Underground transmission construction is particularly susceptible to cost and productivity impacts due to unforeseen subsurface conditions, such as shallow bedrock, boulders, cobbles, and unstable soil or bedrock conditions. While overhead transmission construction allows targeted soil sampling and borings at each proposed structure location, underground transmission is continuous and it is therefore impossible for borings to identify all subsurface conditions.

The most common risk for below grade construction is encountering bedrock shallower than expected. In areas with shallow bedrock, trenching would require blasting, hoe ram, or similar excavation methods.

Trenchless construction methods in particular are very susceptible to unforeseen pockets of gravel or cobbles which may collapse into the boring, binding the drill tooling or conduit piping.

The amount of excavation required for underground transmission makes progress and productivity particularly susceptible to extreme rain events.



## **8. Additional Risks During Operation of Underground Lines**

Overhead faults are often due to debris (e.g., limbs, trees) that is dislodged during the fault or quickly removable, allowing the line to return to service quickly. When a fault occurs on an overhead transmission line it would automatically be isolated at the HVDC converter stations. The overhead line would be then be drained of any remaining energy and within seconds the line would automatically be restored to service, assuming the fault was temporary. This automatic return to service process is referred to as reclosing the line. With an underground cable good utility practice necessitates not reclosing on the cable segment, because most underground cable faults result from inherent damage to the cable insulation and require repair before being restored to service. This practice helps to avoid additional damage to the cable and prevents public exposure to potentially energized cable which has been exposed and damaged due to improper excavation by a third party.

When overhead and underground segments are combined in a single transmission line a typical solution to allow reclosing would be to establish larger cable termination stations with a full local protection system that can accurately determine the location of the fault and prevent the line from automatically reclosing if the fault is expected to be in the buried cable segment. Operation of such protection and monitoring equipment requires AC electrical station service to supply power. The cost of establishing AC station service may be excessively high, and thus not practicable, due to the distance from existing AC electrical distribution service.

As an alternative approach to such local protection equipment, remote monitoring equipment could be used to estimate the fault location. These estimates of the fault location are not precise. CMP would need to block automatic reclosing for faults near the underground portion, including some length of the overhead line. Estimates from converter vendors indicate

that the length of overhead line where faults would not be able to be reclosed would be approximately one mile on each side of the underground cable, or two miles in total.

This configuration would prevent CMP from quickly restoring the line in the case of faults in the overhead portions of the line adjacent to underground sections, reducing overall line availability and reliability. CMP has accepted this reduction in reliability for the upper Kennebec River underground cable section, but every additional section of underground would add more segments of overhead transmission line that would not automatically reclose for temporary faults, which would prevent quick restoration of the line and would therefore be inconsistent with the Project's purpose.

Also, while cable faults are less likely with underground cable than overhead lines, they typically result in more significant damage to the cable system, preventing a return to service without difficult repairs. Underground faults are very costly and time-consuming to identify, isolate, and repair, and usually require dispatching heavy equipment to the affected section to repair or replace the cable. The repair time of an underground fault increases in cold weather climates, with access limitations due to winter ground conditions.

Outages in an overhead line are often restored in a few hours, while outages in underground cables typically require 2 to 5 weeks to restore.

## **B. P-RR SUBDISTRICT UNDERGROUND ALTERNATIVES**

The P-RR subdistrict crossings at issue are the upper Kennebec River crossing, Joe's Hole/Troutdale Road Appalachian Trail (AT) crossing, and in the vicinity of Beattie Pond. CMP has performed an analysis of alternate underground alternatives at each location.

### **1. Upper Kennebec River Crossing**

The crossing location at the upper Kennebec River Crossing does not have an existing overhead transmission line and sees a large number of recreational visitors due to river rafting

tourism. CMP originally proposed an overhead HVDC line crossing of the upper Kennebec River. Based on the outreach efforts in the area CMP modified its design to underground the approximately 1-mile long segment of transmission line to eliminate the visual impacts of NECEC Project at this particularly sensitive location at which there is no existing transmission line and where other visual mitigation methods would be largely ineffective.

The underground line is being installed mostly by HDD at the estimated cost provided by Mr. Tribbet (in his rebuttal testimony) of \$31 million, approximately 15 times the originally planned overhead crossing.

## **2. Joe's Hole/Troutdale Road Appalachian Trail Crossings**

The current location and route of the Appalachian Trail (AT) is within and adjacent to an approximately 3,500-foot-long segment of existing CMP transmission line corridor. The AT crosses this existing corridor, which currently contains a 115 kV overhead transmission line, in three locations adjacent to Moxie Pond and Trestle Road in Bald Mountain. See Exhibit CMP-3-D; CMP-8-J.

CMP has given due consideration for both underground and overhead line alternatives in this area. CMP has worked extensively to evaluate overhead line alternatives to minimize impacts. Due to co-location of the new transmission line within the existing ROW, the Project as proposed will cause a negligible change in visual impact to hikers using the trail.

An underground alternative would require construction of termination stations within sight of the trail, along with a trenchless crossing of Joe's Hole and the three AT crossings, approximately 3,500 feet long. Costs for this underground alternative would be approximately

\$28.9 million,<sup>11</sup> which would be an incremental cost to the Project of \$28 million when removing the associated overhead line costs. Construction activities would require approximately 10 months in close proximity to the AT crossings for the trenchless crossing, construction of the termination stations, and cable installation.

Horizontal directional drilling rigs used for long crossings are built into a trailer frame and are approximately 45 feet long. The rig is powered by an external diesel powered hydraulic power plant. The rigs generate noise of approximately 110 decibels continuously while in operation. In the case of the upper Kennebec River crossing the drill rig would be over 1,000 feet from the Kennebec River and associated recreational users. In contrast, for the AT crossings the rig would be within 200 feet.

As described in Mr. Freye's rebuttal testimony, CMP engaged with the Appalachian Trail Conservancy (ATC) and Maine Appalachian Trail Club (MATC) in discussions concerning the possibility of relocating the AT to reduce the number of times it crosses the existing corridor, in which the Project will be located. ATC and MATC indicated that they prefer maintaining the current AT location. The easement allowing the AT in CMP's corridor includes provisions for additional overhead lines, but does not contemplate underground installations, so CMP would need to seek such rights from the National Park Service to allow underground installation.

Given the presence of the existing 115 kV transmission line, the very high cost of undergrounding in this location, and the fact that the underground alternative would have additional environmental and public impacts, undergrounding is not practicable or suitable to the

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<sup>11</sup> Underground Cost Estimate, Appalachian Trail Crossing, attached as Exhibit CMP-11-E.

proposed use and is not reasonably available to the applicant within this P-RR subdistrict. Thus, there is no alternative which is both suitable to the proposed use and reasonably available to CMP.

### **3. Beattie Pond**

Undergrounding the line in this area would consist of installing termination stations just outside of the P-RR subdistrict and connecting them with approximately 1.2 miles of direct buried cables, including three jointing locations. Two sets of wetlands and a perennial stream have been identified within the proposed route. These wetlands would require crossing by approximately 1,000-foot long HDD installations.

Underground construction would require clearing and continuous surface disruption in the P-RR subdistrict and would cost approximately \$15.3 million.<sup>12</sup> This would be an incremental cost to the Project of \$13.2 million when removing the associated overhead line costs.

Beattie Pond is a controlled access area with limited ingress points. To maintain access to the jointing locations CMP would need to add alternate access points and secure them against third party access.

This proposed short underground cable segment of the NECEC HVDC transmission line at Beattie Pond would create operational problems for CMP. As discussed previously, with an underground cable good engineering practice is to not automatically reclose on the cable segment. To address this concern CMP would need to implement local protection and monitoring

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<sup>12</sup> Underground Cost Estimate, Beattie Pond, attached as Exhibit CMP-11-F.



systems that require AC station service to identify if a system fault is in the underground portion. Due to the extreme remoteness of Beattie Pond, approximately 37 miles from Route 201 by private road, the cost of establishing AC station service would be \$3 million and doing so would have additional environmental and public impacts.

Thus, CMP would need to prevent reclosing for faults within one mile of the underground cable, or two miles in total, to account for the limited accuracy of the remote fault locating methods discussed previously. CMP has accepted this reduction in reliability for the upper Kennebec River underground cable section, but every additional section of underground line would add more segments of overhead transmission line that would not automatically reclose for temporary faults, preventing CMP from restoring the line to service quickly, which is inconsistent with the Project's purpose.

In addition to the reclosing concerns, the remote location of the termination stations in the Beattie Pond area would be a significant operational challenge in the winter months, because logging roads necessary to access this area are not plowed. While CMP accepted some level of risk at the upper Kennebec River underground crossing, Beattie Pond is much farther from paved and maintained roads, and each segment of underground line creates additional operational and maintenance concerns, which undermine achieving the Project's purpose.

As described in Ms. Segal's pre-filed direct testimony, CMP re-engineered the overhead transmission structures near Beattie Pond, including reducing the height of one structure, which substantially reduced and mitigated the visual impacts of the Project as viewed from Beattie Pond.

Due to the limited, if any, benefits and the additional impacts of underground compared to the significant anticipated cost increase, as well as concerns regarding limited winter

accessibility and protracted service restoration timelines, undergrounding the transmission line in this area would not be practicable or suitable to the proposed use, and is not reasonably available, especially when a practicable, reasonable, and reasonably available alternative has been proposed that does not result in an unreasonable impact.

### **C. ADDITIONAL EVALUATED ALTERNATIVES – GOLD BROOK**

Undergrounding the line in this area would consist of installing termination stations in the vicinity of proposed structures 714 and 720. Two HDD installations, with approximate lengths of 3,400 feet and 2,300 feet, would be required to connect them without disturbing the wetlands adjacent to Gold Brook. A jointing location would be required between the drills in the vicinity of currently proposed structure 717. Access to the jointing location would require construction of a permanent bridge over Gold Brook.

Ground conditions in this area are particularly challenging, with steep slopes and shallow bedrock. Additional investigation would be required to confirm the feasibility of the HDD installations in this area. Based on the currently available information, undergrounding this portion of the line would cost approximately \$33.5 million.<sup>13</sup> This would be an incremental additional cost to the Project of \$30.3 million when removing the associated overhead line costs and agreed upon mitigation measures.

This proposed short underground cable segment of the NECEC HVDC transmission line at Gold Brook would create operational problems for CMP. As discussed previously, with an underground cable good engineering practice is to not automatically reclose on the cable

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<sup>13</sup> Underground Cost Estimate, Gold Brook attached as Exhibit CMP-11-G.

segment. To address this concern CMP would need to implement local protection and monitoring systems that requires AC station service to identify if a system fault is in the underground portion. Due to the extreme remote nature of Gold Brook, approximately 22 miles from Route 201 by private road, the cost of establishing AC station service would be approximately \$2 million, and doing so would create additional environmental and public impacts.

Thus, CMP would need to prevent reclosing for faults within one mile of the underground cable, or two miles in total, to account for the limited accuracy of the remote fault locating methods discussed previously. CMP has accepted this reduction in reliability for the upper Kennebec River underground cable section, but every additional section of underground line would add more segments of overhead transmission line that would not automatically reclose for temporary faults, preventing CMP from restoring the line to service quickly -- which is inconsistent with the Project's purpose.

In addition to the reclosing concerns, the remote location of the termination stations in the Gold Brook area would be a significant operational challenge in the winter months, because the logging roads to access this area are not plowed. While CMP accepted some level of risk at the upper Kennebec River underground crossing, Gold Brook is much farther from paved and maintained roads, and each segment of underground line would create additional operational and maintenance concerns, which undermine achieving the Project's purpose (i.e., transmitting the power to Massachusetts).

Due to the limited, if any, benefits and the additional impacts of underground compared to the significant cost increase, as well as concerns regarding limited winter accessibility and protracted service restoration timelines, undergrounding the transmission line in this area would not be practicable or suitable to the proposed use, and is not reasonably available, especially

when a practicable, reasonable, and reasonably available alternative has been proposed that does not result in an unreasonable impact.

**D. CONTRARY TO MR. RUSSO’S CLAIMS, UNDERGROUNDING THE TRANSMISSION LINE IS NOT A PRACTICABLE OR REASONABLY AVAILABLE ALTERNATIVE.**

CMP has evaluated constructing the line underground. The purpose of the Project as indicated in Mr. Berube’s testimony is delivering clean energy generation from Québec to New England at the lowest cost to ratepayers. This Project must also meet the requirements of the Transmission Services Agreements resulting from the 83D process. As part of these agreements the line is required to meet a guaranteed availability of 90% every month. For the following reasons undergrounding additional segments of the line would create significant and unacceptable cost, availability, and schedule risk to the NECEC Project. Additional undergrounding of the Project in the P-RR subdistricts, or in other areas, would not meet the Project purpose and would impose unreasonable and unnecessary costs.

**1. Cost**

Constructing the entire line underground would increase the cost of the transmission portion of the Project by 500% to 700%.<sup>14</sup> This cost increase far exceeds the limited benefits obtained by undergrounding the line.

For the P-RR subdistricts CMP has evaluated each location and agreed to install underground in the one location where these high incremental costs could be justified by the impacts mitigated. The upper Kennebec River aerial crossing would cause substantial visual impacts due to the Project which otherwise would be difficult to mitigate adequately.

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<sup>14</sup> Justin Tribbet Rebuttal Testimony.

The additional visual impacts of the proposed overhead design at the Appalachian Trail crossings and in the vicinity of Beattie Pond will be minimal, and in any case are minor compared to the significant incremental additional costs, as well as access and operational challenges associated with transmission line burial in those areas.

Given these much higher costs, undergrounding of the transmission line in areas other than the upper Kennebec River would be cost-prohibitive.

## **2. Stream, Wetland, and Vernal Pool Impacts**

The NECEC overhead HVDC line was carefully designed to avoid impacts to protected and sensitive natural resources such as wetlands and vernal pools. Structures have been located outside of these and other natural resources to the greatest extent practicable, and the proposed HVDC overhead transmission line spans, and hence avoids, most natural resources. Underground construction methods required to entirely avoid impacts to these resources increase cost substantially and would cause other impacts, such as large clearing areas for setup of HDD operations to bore beneath resources.

Other than HDD installations, underground construction requires a continuous trench (rather than placing structures every 800 to 1,000 feet), and because streams and wetlands cannot be spanned, soil must be stockpiled during construction and managed properly to prevent erosion and sedimentation; if not all soil can be returned to the trench, on-site or offsite spoils disposal would be needed. Thus, environmental impacts of underground construction are in many cases greater than overhead construction. Mr. Russo fails to properly identify these impacts of undergrounding.



### 3. Clearing

Mr. Russo implies in his testimony that undergrounding the HVDC transmission line would have significant clearing benefits: “Significant stakeholder opposition to NECEC clear-cutting the 53-mile greenfield forested corridor due to the clearing’s negative impact on natural resources including scenic and recreation values.”<sup>15</sup>

Mr. Russo, again, is mistaken. Undergrounding will not alleviate the need to clear the forested corridor. In order to properly install and maintain an underground cable system, prevent tree root growth into the duct bank, and prevent impacts to cable ratings due to soil moisture content reduction by the trees, the maintained cleared corridor width would need to be 75 feet. Permanent clearing would include access roads, and vegetation would be limited to and maintained in herbaceous growth, shrubs, and small trees. The termination stations also would need to be maintained as aggregate pavement surfacing, creating additional permanent impervious surface impacts.

In short, Mr. Russo fails to properly consider, identify, or quantify the clearing impact of undergrounding.

### 4. Visual Impacts

Mr. Russo characterizes the proposed routing of the NECEC HVDC line as presenting “unreasonable interference with scenic character, existing scenic, aesthetic, recreational, or navigational uses, and unreasonable impacts to protected natural resources.”<sup>16</sup> In fact, CMP’s proposed route was carefully selected to maximize co-location with existing transmission lines

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<sup>15</sup> See page 3 of Pre-Filed Testimony of Christopher Russo.

<sup>16</sup> See page 2 of Pre-Filed Testimony of Christopher Russo.

for 92 miles to minimize such impacts; overall, more than 70% of the NECEC Project transmission line will be co-located with existing transmission lines.

With respect to the new corridor portion of the Project, CMP carefully routed the proposed HVDC transmission line through private working forests and away from public rights of way, high value recreational and scenic areas, and conserved lands to minimize impacts. Weyerhaeuser, the owner of most of the land adjacent to the proposed NECEC corridor, has stated its position that it “does not want regulators, including DEP, to consider views from our land (including photosimulations from photos taken from our land) in deciding whether the CMP project will have an adverse effect on the scenic character of our land. We have no concerns about our ability to continue our sustainable management of our adjacent timberlands. Any scenic impact on Weyerhaeuser’s land from the CMP project will be minor, reasonable, and in keeping with the working forest.”<sup>17</sup> This statement demonstrates that the major landowner in the vicinity of the Project is not concerned about the Project’s potential impact to its working forest lands.

In addition, the termination stations used to transition between overhead and underground transmission present substantially different visual impacts, and have significantly larger footprints, than the overhead transmission structures. Being constructed similar to a substation requires additional structures for supporting the terminations, surge arrestors, and auxiliary equipment along with fencing to prevent access.

In short, Mr. Russo fails to properly consider CMP’s siting efforts to locate the Project in a working industrial forest.

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<sup>17</sup> See pages 1-2 of February 21, 2019 letter from Weyerhaeuser to the DEP with subject: RE: Adjacent landowner comments regarding the Central Maine Power Co.’s NECEC transmission project.

## **5. Added Impacts and Risk During Construction**

Constructing additional portions of the Project underground would increase environmental and public impacts during construction due to the significantly larger area of disruption during construction and the extended duration of construction activities.

Underground construction methods have higher cost and productivity risk during construction due to rough terrain, subsurface conditions such as unforeseen rock, boulders, and cobbles, and more challenging construction methods required to minimize underground installation impacts.

## **6. Added Risk During Operation**

Also, the need for significant length(s) of underground cable would add to the operational risk of the NECEC Project. The Project has a 90% per month availability contractual requirement. Overhead faults are often due to debris (e.g., trees, limbs) that is dislodged during the fault or quickly removable, allowing the line to return to service quickly. With underground cable, while cable faults are less likely than overhead faults, they are typically caused by, or result in more significant damage to, the cable system, preventing a return to service without difficult repairs. Underground faults are very costly and time-consuming to identify, isolate, and repair, which translates into a reduction in reliability of the Project. Any fault in the cable system would be unable to be repaired within the 2 to 3 days available under the contract requirements. This can only be mitigated the way it has been done at the upper Kennebec River crossing, i.e., by installing a spare cable, substantially increasing installation cost which, as explained before, can only be considered in the locations where the overhead design may result in an unreasonable unavoidable impact.

### **III. CONCLUSION (RELEVANT TO DEP AND LUPC REVIEW)**

CMP has comprehensively analyzed the option of undergrounding all or portions (including the entirety of the new corridor area) of the NECEC Project transmission line, and concluded that this option is not a practicable, reasonably available alternative suitable to the Project purpose that would be less damaging to the environment. The purpose of the Project is delivering clean energy generation from Québec to New England at the lowest cost to ratepayers, which delivery requires availability of at least 90% every month. Underground construction of the line or additional portions of the line would cause exorbitant incremental costs, additional construction challenges compared to the current design, and substantial operational and availability risks.

Underground construction has a limited reduction in clearing and the associated impacts on wetlands and vernal pools compared to overhead construction, while increasing surface disruption outside of wetlands and requiring higher cost and risk installation methods.

Subsequent to its original analysis CMP has worked successfully with several impacted parties, LUPC, and DEP to adjust and modify the overhead design to avoid or minimize its impacts, with particular focus on the P-RR subdistricts at the upper Kennebec River crossing, the Joe's Hole/Troutdale Road Appalachian Trail crossing, and the Beattie Pond area. Constructing the line underground in additional areas would have limited benefits at exorbitant costs, additional impacts during construction, and substantial additional risk during construction and operation.

Outside of the P-RR districts underground construction of the line also would offer few, if any, benefits while still causing additional costs and impacts. In particular at the Gold Brook

crossing, the extremely challenging terrain and conditions would make underground construction extremely costly and risky, with minimal if any benefits.

Contrary to the testimonies of the interveners referred to above, CMP has evaluated underground alternatives in these locations, as the proposed HDD solution for the upper Kennebec River crossing demonstrates. For the locations referenced above, CMP has demonstrated that the limited impact of the designed overhead solution and the limited to non-existent benefits of an underground solution, combined with the additional costs and impacts of underground construction, make underground construction in additional areas, or the Project as a whole, an alternative that is not a practicable or reasonably available.

#### Exhibits

CMP-11-A: Bardwell CV

CMP-11-B: Underground Cost Estimate, Proposed Route

CMP-11-C: Underground Cost Estimate, New Corridor Only

CMP-11-D: Underground Cost Estimate, Underground Alternate Route

CMP-11-E: Underground Cost Estimate, AT Crossings

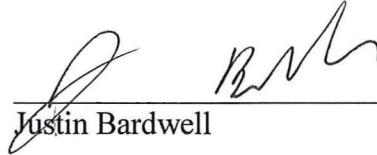
CMP-11-F: Underground Cost Estimate, Beattie Pond

CMP-11-G: Underground Cost Estimate, Gold Brook




Dated: 3/18/19

Respectfully submitted,

  
Justin BardwellSTATE OF KANSAS  
Johnston County, ss.

The above-named Justin Bardwell did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Before,

Dated: 3/18/2019  
Notary Public  
Name:  
My Commission Expires:



## Justin R. Bardwell, P.E.

Justin Bardwell is the manager for underground transmission line engineering for Black & Veatch Energy Division's Power Delivery Business Line. His experience includes project coordination, scheduling, estimation, electrical design, underground design, procurement specifications, subcontract specifications, CAD drafting, and construction support.

### PROJECT EXPERIENCE

#### ATC; Straits Cable Replacement; Michigan

##### 2018-In-Progress

**Engineering Manager - Black & Veatch.** Owner's Engineer for a 138kV submarine cable replacement project. Project is approximately 4 miles long and includes removal of existing self-contained fluid-filled submarine cables, installation of new three-core submarine cables, and modifications to terminal stations. Responsible for cost and schedule estimating, supporting permitting, preparing conceptual design, preparing EPC specifications, reviewing detailed design, and engineering submittals.

#### Eversource; K Street to Deer Island; Massachusetts

##### 2017-In-Progress

**Engineering Manager - Black & Veatch.** Project Engineer for a 115kV submarine cable replacement project. Project is approximately 2.5 miles long and includes installation of a new three-core submarine cable, installation of duct bank and cable on land, and shore line crossings by HDD. Responsible for cost and schedule estimating, supporting permitting, preparing conceptual design, preparing detailed design, material, and construction specifications, and reviewing engineering submittals.

#### WS Development; Massachusetts

##### 2018-In-Progress

**Engineering Manager - Black & Veatch.** Design Engineer for a 115kV high-pressure fluid filled (HPFF) cable replacement project. Project includes installing approximately 0.5 mile of new pipe and cable intercepting an existing HPFF circuit, including cast in place splicing vaults. Responsible for cost and schedule estimating, supporting permitting, preparing conceptual design, preparing detailed design, material, and construction specifications, and reviewing engineering submittals.

#### Pepco; White Flint Substation; Washington D.C.

##### 2018-In-Progress

**UG T-Line Lead - Black & Veatch.** Supervise the coordination of incoming UG transmission lines with the rebuilding of a GIS substation inside a historic structure including cable racking and terminations. Project includes preparation of construction drawings, structural calculations, thermo-mechanical analysis of cable racking, and coordination between the cable and GIS supplier.

### Engineering Manager

#### Expertise:

Cable; Power Delivery;  
Transmission; Underground

#### Education

Bachelor of Science, Electrical Engineering, Kansas State University, 2005

#### Professional Registration

License, Professional Engineer, Electrical, #53869, Massachusetts, 2017

License, Professional Engineer, General, #81573, Ohio, 2017

License, Professional Engineer, General, #24GE05382100, New Jersey, 2017

License, Professional Engineer, General, #31878, Connecticut, 2016

License, Professional Engineer, Electrical, #6201062411, Michigan, 2015

License, Professional Engineer, Electrical, #46034, Maryland, 2014

License, Professional Engineer, Electrical, #21123, Kansas, 2014

#### Total Years of Experience

14

#### Professional Associations

Institute of Electrical and Electronics Engineers - Member

#### Language Capabilities

English

#### Office Location

Overland Park, Kansas, USA

### **Pepco; Mt. Vernon Substation; Washington D.C.**

#### **2018-In-Progress**

**UG T-Line Lead - Black & Veatch.** Supervise the coordination of incoming UG transmission lines with the rebuilding of a GIS substation inside a historic structure including cable racking and terminations. Project includes preparation of construction drawings, structural calculations, thermo-mechanical analysis of cable racking, and coordination between the cable and GIS supplier.

### **Pepco; Harvard Substation; Washington D.C.**

#### **2018-In-Progress**

**UG T-Line Lead - Black & Veatch.** Supervise the coordination of incoming UG transmission lines with the rebuilding of a GIS substation inside a historic structure including cable racking and terminations. Project includes preparation of construction drawings, structural calculations, thermo-mechanical analysis of cable racking, and coordination between the cable and GIS supplier.

### **National Grid and Eversource; Woburn to Wakefield; Massachusetts**

#### **2017-In-Progress**

**Project Engineer - Black & Veatch.** Lead a project team completing the detailed design, procurement support, and construction support for a 345kV UG T-line. Project is approximately 4 miles long and includes preparation of construction drawings, specifications, structural calculations, electrical calculations, evaluating proposals, and construction records.

### **Baltimore Gas & Electric; Fitzell UG Sources; Maryland**

#### **2017-In-Progress**

**Engineering Manager - Black & Veatch.** Lead a team preparing a routing, feasibility, and planning report for a double circuit 115kV XLPE UG T-Line. Report includes scoring each route by estimating cost, schedule, environmental impact, social impact, permitting process, and risks.

### **ITC; Lake Erie Connector; Pennsylvania and Ontario, Canada**

#### **2014-In-Progress**

**UG Engineer - Black & Veatch.** Owner's Engineer for a project that includes HVDC convertor stations, 2 miles of 500kV AC cable, 0.5 mile of 345kV AC cable, 10 miles of 320kV HVDC cable on land, 70 miles of 320kV HVDC submarine cable, and 2 shoreline crossings by HDD. Responsible for cost estimating, supporting permitting, preparing conceptual design, preparing EPC specifications, reviewing detailed design, and engineering submittals.

### **BGE; Westport to Wilkens Avenue; Maryland**

#### **2007-2018**

**Design Engineer/Cable Systems Engineer/Engineering Manager - Black & Veatch.** Responsible for conceptual and detail design, including route design, route alignment, manhole design, specification and locating, duct bank design, cable calculations, and cable system specification. This Engineering Services project consisted of two 115kV circuits, approximately 2.2 miles long, from the existing Westport substation to the new Wilkens Avenue substation. The cable was installed in new concrete encased duct bank with multiple auger boring and HDD installations.

### Baltimore Gas & Electric; Raphael Road to Joppatowne; Maryland

2013-2018

**Engineering Manager - Black & Veatch.** Project included construction of a double circuit 115kV XLPE underground transmission line approximately 2.7 miles long between two existing substations. Responsible for coordinating design engineering, permitting support, procurement support, and construction support.

### Baltimore Gas & Electric; SW Project; Maryland

2009-2018

**Lead Engineer - Black & Veatch.** Project included construction of 2 new GIS substations, 5 double circuit 115kV XLPE underground transmission lines totaling 11 circuit miles, and 7 230kV XLPE single circuit transmission lines totaling 9 circuit miles. Responsible for design, specification, and procurement and construction support for duct bank, cable systems, and substation interfaces.

### American Transmission Company; Mackinac Straits Restoration Plan; Wisconsin

2016-2017

**Principal Engineer - Black & Veatch.** Prepared a report detailing the condition of the existing 115kV self-contained fluid-filled submarine cable system, potential failure modes, and corrective actions for each failure mode.

### SMECO; Patuxent River Crossing; Maryland

2008-2014

**Design Engineer/Cable Systems Engineer - Black & Veatch.** Responsible for conceptual and detail design, including route design, route alignment, manhole design, specification and locating, duct bank design, cable calculations and cable system specification. This Engineering Services project consisted of two 230kV circuits, approximately 1.8 miles long, from one side of the Patuxent River to the other. The cable was installed in an approximately 4,300-foot horizontal directional drilled fusible PVC duct bank and 5,300 feet of concrete encased duct bank.

### The United Illuminating Company; Grand Avenue Modernization; Connecticut

2009-2013

**Design Engineer - Black & Veatch.** Turnkey project to replace an existing air-insulated substation with a new GIS substation and transfer all transmission lines to the new substation, including replacing all monitoring and pressurization systems for the underground transmission lines. Responsible for engineering, procurement, and construction to bring 2 existing HPFF pipe-type lines and 1 existing SCFF line to the new switchgear, along with replacement of 2 circulating pressurization plants and remote end termination replacement.

### The United Illuminating Company; Union Avenue Substation; Connecticut

2008-2012

**Design Engineer - Black & Veatch.** Turnkey project to construct a new substation and modify an existing 115kV SCFF underground transmission line to connect to the new substation. Responsible for engineering, procurement and construction of duct bank, cable system, pressurization system, and substation interfaces.



**MDU; Memorial Bridge Reroute; North Dakota****2006-2008**

**Project Engineer/Cable Systems Engineer/UGT Designer - Black & Veatch.** Responsible for project coordination, conceptual and detail design, including route design, route alignment, manhole design, specification and locating, duct bank design, cable calculations, and cable system specification. This E&CM project consisted of three circuits at 115kV and 69kV being routed through the enclosed supports of a 1,650-foot-long bridge under construction. Each circuit included a few hundred feet of underground duct bank on each side of the bridge. The circuit included six single pole risers complete with an energized spare cable and terminator systems.

**ITC; Bismarck-Troy 345 kV; Michigan****2005-2008**

**Project Engineer/Cable Systems Engineer/UGT Designer - Black & Veatch.** Responsible for conceptual and detail design, including route design, route alignment, manhole procurement and locating, duct bank design, cable calculations, and cable system procurement. This EPC project included 11.2 miles of 345kV Solid Dielectric underground transmission line, and two substation terminations, optical fiber for communication, and remote temperature sensing.

**ITC; Erin-Stephens No. 3 120 kV; Michigan****2005-2007**

**Electrical Engineer/UGT Designer/CAD Operator - Black & Veatch.** Responsible for conceptual and detail design, including route design, route alignment, manhole procurement and locating, duct bank design, cable calculations and cable system procurement. This EPC project included 4.5 miles of 138kV Solid Dielectric underground transmission line to be energized at 120kV, and two substation terminations and optical fiber for communications.



Owner **Avangrid** Computed By **N. Thomas**  
 Project **NECEC**  
 B&V File No. 400319.42.3000  
 Title **Underground Cost Estimate, Proposed Route** Checked By **J. Bardwell**  
 Estimate Overall Route Length **146.88 Miles** **1 DC Circuits**  
**775,504 Feet** **390 Splices per Circuit** **2 Cables per Pole**

| Item                                                      | Qty              | Unit                            | Material<br>Unit<br>Cost | Total<br>Mat'l<br>Cost | Labor<br>Unit<br>Cost | Total<br>Labor<br>Cost | TOTAL<br>COST          |
|-----------------------------------------------------------|------------------|---------------------------------|--------------------------|------------------------|-----------------------|------------------------|------------------------|
| <b>CABLE SYSTEM FURNISH AND INSTALL</b>                   |                  |                                 |                          |                        |                       |                        |                        |
| <b>UG CABLE AND ACCESSORIES SUBTOTAL</b>                  |                  |                                 |                          | <b>\$637,198,300</b>   |                       | <b>\$120,015,200</b>   | <b>\$757,213,500</b>   |
| <b>COMMUNICATIONS</b>                                     |                  |                                 |                          |                        |                       |                        |                        |
| <b>CABLE SYSTEM COMMUNICATIONS (FO) SUBTOTAL</b>          |                  |                                 |                          | <b>\$6,944,924</b>     |                       | <b>\$8,170,818</b>     | <b>\$15,115,742</b>    |
| <b>CIVIL WORK</b>                                         |                  |                                 |                          |                        |                       |                        |                        |
| <b>GENERAL SUBTOTAL</b>                                   |                  |                                 |                          | <b>\$300,000</b>       |                       | <b>\$2,285,947</b>     | <b>\$2,585,947</b>     |
| <b>OVERHEAD TO UNDERGROUND SUBTOTAL</b>                   |                  |                                 |                          | <b>\$0</b>             |                       | <b>\$0</b>             | <b>\$0</b>             |
| <b>SPLICING VAULT SUBTOTAL</b>                            |                  |                                 |                          | <b>\$20,182,500</b>    |                       | <b>\$26,325,000</b>    | <b>\$46,507,500</b>    |
| <b>DIRECT BURIED</b>                                      |                  |                                 |                          | <b>\$47,278,180</b>    |                       | <b>\$239,802,869</b>   | <b>\$287,081,049</b>   |
| Direct Buried cost per route foot                         | 458.96           |                                 |                          |                        |                       |                        |                        |
| <b>HDD INSTALLATION SUBTOTAL</b>                          |                  |                                 |                          | <b>\$42,600,000</b>    |                       | <b>\$169,100,000</b>   | <b>\$211,700,000</b>   |
| HDD Ductbank cost per route foot(1 Bores))                | \$1,411.33       |                                 |                          |                        |                       |                        |                        |
| <b>ESTIMATED LABOR &amp; MATERIAL COST</b>                |                  |                                 |                          | <b>\$754,503,904</b>   |                       | <b>\$565,699,834</b>   | <b>\$1,320,203,738</b> |
| <b>ESCALATION</b>                                         | <b>3 Years @</b> | <b>2.50%</b>                    |                          | <b>\$56,588,000</b>    |                       | <b>\$42,427,000</b>    | <b>\$99,015,000</b>    |
| <b>ESCALATED CONSTRUCTION COST</b>                        |                  |                                 |                          | <b>\$811,091,904</b>   |                       | <b>\$608,126,834</b>   | <b>\$1,419,218,738</b> |
| <b>Mark-Up</b>                                            | <b>10.0%</b>     | <b>of Est. Labor &amp; Mat.</b> |                          | <b>\$81,109,000</b>    |                       | <b>\$60,813,000</b>    | <b>\$141,922,000</b>   |
| <b>ESTIMATED PROJ COST</b>                                |                  |                                 |                          | <b>\$892,200,904</b>   |                       | <b>\$668,939,834</b>   | <b>\$1,561,140,738</b> |
| <b>STATE SALES TAX</b>                                    | <b>5.5%</b>      | <b>of Materials</b>             |                          | <b>\$49,071,000</b>    |                       |                        | <b>\$49,071,000</b>    |
| <b>ROW ACQUISITION</b>                                    |                  | <b>\$0 per Mile</b>             |                          |                        |                       |                        | <b>\$0</b>             |
| <b>MITIGATION</b>                                         |                  |                                 |                          |                        |                       |                        | <b>\$0</b>             |
| <b>TOPOGRAPHIC SURVEYING/SOIL EXPLORATION @ 40,000/mi</b> |                  |                                 |                          |                        |                       |                        | <b>\$5,875,030</b>     |
| <b>ENGINEERING AND CONSTRUCTION MANAGEMENT</b>            |                  |                                 |                          |                        |                       |                        | <b>\$31,222,815</b>    |
| <b>CONTINGENCY</b>                                        | <b>14.46%</b>    | <b>of project cost</b>          |                          |                        |                       |                        | <b>\$231,105,299</b>   |
| <b>ESTIMATED TOTAL PROJ COST</b>                          |                  |                                 |                          |                        |                       |                        | <b>\$1,878,414,883</b> |
| <b>UNDERGROUND PROJECT TOTAL</b>                          |                  |                                 |                          |                        | <b>(rounded)</b>      |                        | <b>\$1,878,400,000</b> |

**Black & Veatch**Owner **Avangrid**Project **NECEC**

B&amp;V File No. 400319.42.3000

Assumptions - Underground Cost Estimate, Proposed Route

General

- 1 The estimate is based on a 320 kV DC Cable installation 146.88 miles long.
- 2 ROW acquisition costs are not included in the estimate.
- 3 Environmental mitigation costs are not included in the estimate.
- 4 The estimate does not include costs related to contaminated or hazardous soils or water.
- 5 The estimate does not include allowances for existing facility relocations.
- 6 The estimate does not include allowances for work hour/location restrictions.
- 7 The estimate is in 2019 dollars and includes 3 years of escalation at 2.5%
- 8 The estimate includes a 10% allowance for prime contractor mark-up.
- 9 The estimate includes a 14.46% contingency.
- 10 The estimate includes sales tax of 5.5% on materials only.

Cable & Accessories

- 11 The estimate assumes a single +/-320kV DC circuit with 2 cables per pole.
- 12 The cables are estimated as 320kV DC, 2500 sq. mm Cu Cable.
- 13 The estimate includes an installed spare cable the full length of the line.
- 14 The estimate includes (10) AIS cable terminations, and 2 spare terminations.
- 15 The estimate includes (2,340) single-phase cable joints, with 4 spare joints.
- 16 The estimate does not include surge arrestors.
- 17 The estimate does not include optical fiber cable inside the power cable for temperature monitoring.

Communications

- 18 The estimate includes two fiber optic cable systems.
- 19 Fiber-optic cables are estimated as 48 fiber, single mode, loose tube outdoor cable.
- 20 Fiber-optic cables are installed into 1 1/4" HDPE innerducts installed in 4" PVC conduit.
- 21 Separate pull/splicing boxes are included for the fiber-optics.

Temperature Monitoring

- 22 The estimate does not include cable temperature monitoring equipment.

Overhead to Underground Transition

- 23 The estimate does not include termination supports or stands.
- 24 The estimate does not include provisions for overhead transmission connections
- 25 The estimate does not include concrete encased sweeps for the cable

Splice Housings

- 26 The estimate includes (390) jointing locations with (5) 12'x4'x3' precast concrete splice housings at each location.
- 27 Each splice housing is assumed to hold (1) splice.

Duct Bank Installation

- 28 The estimate does not include duct bank.

Direct Buried Installation

- 29 The estimate does not include conduits in the direct buried sections.
- 30 The estimate includes soil erosion and sediment control measures for green spaces.
- 31 The cables are installed in a single 5' wide trench averaging 7' deep.
- 32 The cables are installed in a thermal sand cable bedding material
- 33 The estimate includes a 9" thick concrete cap installed 18" below grade
- 34 The estimate assumes backfilling direct buried sections with native soils.
- 35 The estimate includes vegetation clearing and restoration 50' wide for construction not in roadways.
- 36 The estimate includes allowance for dewatering for 50% of the trench in uplands, and 100% in wetlands.
- 37 The estimate does not include shoring for the trenches.

HDD Installation

- 38 The estimate includes (150) sets of HDD installations in soil, 1000 feet long each.
- 39 Each HDD installation consists of the bundled FPVC or HDPE conduits pulled directly into the boreholes.
- 40 The HDD installations do not include a casing.
- 41 The HDD installations do not include grouting of the bore hole.

Engineering & Construction Management

- 42 The estimate includes surveying, and soil exploration.
- 43 The estimate includes approximate engineering costs.
- 44 The estimate includes construction management based on a 15 month construction duration.





Owner **Avangrid** Computed By **J. Bardwell**  
 Project **NECEC**  
 B&V File No. 400319.42.3000  
 Title **Underground Cost Estimate, New corridor portion of Proposed Route**  
 Estimate Overall Route Length **53.50 Miles** 1 DC Circuits  
**282,480 Feet** 143 Splices per Circuit 2 Cables per Pole

| Item                                                      | Qty              | Unit                            | Material<br>Unit<br>Cost | Total<br>Mat'l<br>Cost | Labor<br>Unit<br>Cost | Total<br>Labor<br>Cost | TOTAL<br>COST        |
|-----------------------------------------------------------|------------------|---------------------------------|--------------------------|------------------------|-----------------------|------------------------|----------------------|
| <b>CABLE SYSTEM FURNISH AND INSTALL</b>                   |                  |                                 |                          |                        |                       |                        |                      |
| <b>UG CABLE AND ACCESSORIES SUBTOTAL</b>                  |                  |                                 |                          | <b>\$232,095,800</b>   |                       | <b>\$39,754,000</b>    | <b>\$271,849,800</b> |
| <b>COMMUNICATIONS</b>                                     |                  |                                 |                          |                        |                       |                        |                      |
| <b>CABLE SYSTEM COMMUNICATIONS (FO) SUBTOTAL</b>          |                  |                                 |                          | <b>\$2,536,280</b>     |                       | <b>\$2,984,003</b>     | <b>\$5,520,283</b>   |
| <b>CIVIL WORK</b>                                         |                  |                                 |                          |                        |                       |                        |                      |
| <b>GENERAL SUBTOTAL</b>                                   |                  |                                 |                          | <b>\$300,000</b>       |                       | <b>\$1,118,750</b>     | <b>\$1,418,750</b>   |
| <b>OVERHEAD TO UNDERGROUND SUBTOTAL</b>                   |                  |                                 |                          | <b>\$272,718</b>       |                       | <b>\$496,809</b>       | <b>\$769,527</b>     |
| <b>SPLICING VAULT SUBTOTAL</b>                            |                  |                                 |                          | <b>\$7,400,250</b>     |                       | <b>\$11,082,500</b>    | <b>\$18,482,750</b>  |
| <b>DIRECT BURIED</b>                                      |                  |                                 |                          | <b>\$13,792,593</b>    |                       | <b>\$69,955,898</b>    | <b>\$83,748,491</b>  |
| Direct Buried cost per route foot                         | \$458.95         |                                 |                          |                        |                       |                        |                      |
| <b>HDD INSTALLATION SUBTOTAL</b>                          |                  |                                 |                          | <b>\$28,400,000</b>    |                       | <b>\$112,850,000</b>   | <b>\$141,250,000</b> |
| HDD Ductbank cost per route foot(2 Bores))                | \$1,412.50       |                                 |                          |                        |                       |                        |                      |
| <b>ESTIMATED LABOR &amp; MATERIAL COST</b>                |                  |                                 |                          | <b>\$284,797,641</b>   |                       | <b>\$238,241,960</b>   | <b>\$523,039,601</b> |
| <b>ESCALATION</b>                                         | <b>3 Years @</b> | <b>2.50%</b>                    |                          | <b>\$21,360,000</b>    |                       | <b>\$17,868,000</b>    | <b>\$39,228,000</b>  |
| <b>ESCALATED CONSTRUCTION COST</b>                        |                  |                                 |                          | <b>\$306,157,641</b>   |                       | <b>\$256,109,960</b>   | <b>\$562,267,601</b> |
| <b>Mark-Up</b>                                            | <b>10.0%</b>     | <b>of Est. Labor &amp; Mat.</b> |                          | <b>\$30,616,000</b>    |                       | <b>\$25,611,000</b>    | <b>\$56,227,000</b>  |
| <b>ESTIMATED PROJ COST</b>                                |                  |                                 |                          | <b>\$336,773,641</b>   |                       | <b>\$281,720,960</b>   | <b>\$618,494,601</b> |
| <b>STATE SALES TAX</b>                                    | <b>5.5%</b>      | <b>of Materials</b>             |                          | <b>\$18,523,000</b>    |                       |                        | <b>\$18,523,000</b>  |
| <b>ROW ACQUISITION</b>                                    |                  | <b>\$0 per Mile</b>             |                          |                        |                       |                        | <b>\$0</b>           |
| <b>MITIGATION</b>                                         |                  |                                 |                          |                        |                       |                        | <b>\$0</b>           |
| <b>TOPOGRAPHIC SURVEYING/SOIL EXPLORATION @ 40,000/mi</b> |                  |                                 |                          |                        |                       |                        | <b>\$2,140,000</b>   |
| <b>ENGINEERING AND CONSTRUCTION MANAGEMENT</b>            |                  |                                 |                          |                        |                       |                        | <b>\$18,554,838</b>  |
| <b>CONTINGENCY</b>                                        | <b>14.46%</b>    | <b>of project cost</b>          |                          |                        |                       |                        | <b>\$92,426,793</b>  |
| <b>ESTIMATED TOTAL PROJ COST</b>                          |                  |                                 |                          |                        |                       |                        | <b>\$750,139,232</b> |
| <b>UNDERGROUND PROJECT TOTAL</b>                          |                  |                                 |                          |                        | <b>(rounded)</b>      |                        | <b>\$750,000,000</b> |

**Black & Veatch**Owner **Avangrid**Project **NECEC**

B&amp;V File No. 400319.42.3000

Assumptions - Underground Cost Estimate, New corridor portion of Proposed Route

General

- 1 The estimate is based on a 320 kV DC Cable installation 53.8 miles long.
- 2 ROW acquisition costs are not included in the estimate.
- 3 Environmental mitigation costs are not included in the estimate.
- 4 The estimate does not include costs related to contaminated or hazardous soils or water.
- 5 The estimate does not include allowances for existing facility relocations.
- 6 The estimate does not include allowances for work hour/location restrictions.
- 7 The estimate is in 2019 dollars and includes 3 years of escalation at 2.5%
- 8 The estimate includes a 10% allowance for prime contractor mark-up.
- 9 The estimate includes a 14.46% contingency
- 10 The estimate includes sales tax of 5.5% on materials only.

Cable & Accessories

- 11 The estimate assumes a single +/-320kV DC circuit with 2 cables per pole.
- 12 The cables are estimated as 320kV DC, 2500 sq. mm Cu Cable.
- 13 The estimate includes an installed spare cable the full length of the line.
- 14 The estimate includes (10) AIS cable terminations, and 2 spare terminations.
- 15 The estimate includes (864) single-phase cable joints, with 10 spare joints.
- 16 The estimate does not include surge arrestors.
- 17 The estimate does not include optical fiber cable inside the power cable for temperature monitoring.

Communications

- 18 The estimate includes two fiber optic cable systems.
- 19 Fiber-optic cables are estimated as 48 fiber, single mode, loose tube outdoor cable.
- 20 Fiber-optic cables are installed into 1 1/4" HDPE innerducts installed in 4" PVC conduit.
- 21 Separate pull/splicing boxes are included for the fiber-optics.

Temperature Monitoring

- 22 The estimate does not include cable temperature monitoring equipment.

Overhead to Underground Transition

- 23 Includes terminations stands, surge arrestor stands and dead-ends for one transition.
- 24 The estimate includes site work and foundations for a 135' square termination station
- 25 The estimate includes ground grid and fencing for a 135' square terminations station.

Splice Housings

- 26 The estimate includes (144) jointing locations with (5) 12'x4'x3' precast concrete splice housings at each location.
- 27 Each splice housing is assumed to hold (1) splice.

Duct Bank Installation

- 28 The estimate does not include duct bank.

Direct Buried Installation

- 29 The estimate does not include conduits in the direct buried sections.
- 30 The estimate includes soil erosion and sediment control measures for green spaces.
- 31 The cables are installed in a single 5' wide trench averaging 7' deep.
- 32 The cables are installed in a thermal sand cable bedding material
- 33 The estimate includes a 9" thick concrete cap installed 18" below grade
- 34 The estimate assumes backfilling direct buried sections with native soils.
- 35 The estimate includes vegetation clearing and restoration 50' wide for construction not in roadways.
- 36 The estimate includes allowance for dewatering for 50% of the trench in uplands, and 100% in wetlands.
- 37 The estimate does not include shoring for the trenches.

HDD Installation

- 38 The estimate includes (100) sets of HDD installations in soil, 1000 feet long each.
- 39 Each HDD installation consists of the bundled FPVC or HDPE conduits pulled directly into the boreholes.
- 40 The HDD installations do not include a casing.
- 41 The HDD installations do not include grouting of the bore hole.

Engineering & Construction Management

- 42 The estimate includes surveying, and soil exploration.
- 43 The estimate includes approximate engineering costs.
- 44 The estimate includes approximately construction management costs.



Owner **Avangrid** Computed By **N. Thomas**  
 Project **NECEC**  
 B&V File No. 400319.42.3000  
 Title **Underground Cost Estimate, Underground Alternate Route** Checked By **J. Bardwell**  
 Estimate Overall Route Length **146.88 Miles** **1 DC Circuits**  
**775,504 Feet** **390 Splices per Circuit** **2 Cables per Pole**

| Item                                                      | Qty              | Unit                            | Material<br>Unit<br>Cost | Total<br>Mat'l<br>Cost | Labor<br>Unit<br>Cost | Total<br>Labor<br>Cost | TOTAL<br>COST          |
|-----------------------------------------------------------|------------------|---------------------------------|--------------------------|------------------------|-----------------------|------------------------|------------------------|
| <b>CABLE SYSTEM FURNISH AND INSTALL</b>                   |                  |                                 |                          |                        |                       |                        |                        |
| <b>UG CABLE AND ACCESSORIES SUBTOTAL</b>                  |                  |                                 |                          | <b>\$641,818,300</b>   |                       | <b>\$104,236,800</b>   | <b>\$746,055,100</b>   |
| <b>COMMUNICATIONS</b>                                     |                  |                                 |                          |                        |                       |                        |                        |
| <b>CABLE SYSTEM COMMUNICATIONS (FO) SUBTOTAL</b>          |                  |                                 |                          | <b>\$6,944,924</b>     |                       | <b>\$8,170,818</b>     | <b>\$15,115,742</b>    |
| <b>CIVIL WORK</b>                                         |                  |                                 |                          |                        |                       |                        |                        |
| <b>GENERAL SUBTOTAL</b>                                   |                  |                                 |                          | <b>\$300,000</b>       |                       | <b>\$2,285,947</b>     | <b>\$2,585,947</b>     |
| <b>OVERHEAD TO UNDERGROUND SUBTOTAL</b>                   |                  |                                 |                          | <b>\$20,036</b>        |                       | <b>\$109,973</b>       | <b>\$130,009</b>       |
| <b>SPlicing VAULT SUBTOTAL</b>                            |                  |                                 |                          | <b>\$40,755,000</b>    |                       | <b>\$92,430,000</b>    | <b>\$133,185,000</b>   |
| <b>DUCTBANK INSTALLATION - ROADWAY</b>                    |                  |                                 |                          | <b>\$70,799,627</b>    |                       | <b>\$128,321,246</b>   | <b>\$199,120,873</b>   |
| Ductbank cost per route foot                              | \$646.87         |                                 |                          |                        |                       |                        |                        |
| <b>DIRECT BURIED</b>                                      |                  |                                 |                          | <b>\$24,011,569</b>    |                       | <b>\$121,790,895</b>   | <b>\$145,802,464</b>   |
| Direct Buried cost per route foot                         | \$458.96         |                                 |                          |                        |                       |                        |                        |
| <b>HDD INSTALLATION SUBTOTAL</b>                          |                  |                                 |                          | <b>\$42,600,000</b>    |                       | <b>\$169,100,000</b>   | <b>\$211,700,000</b>   |
| HDD Ductbank cost per route foot(1 Bores))                | \$1,411.33       |                                 |                          |                        |                       |                        |                        |
| <b>ESTIMATED LABOR &amp; MATERIAL COST</b>                |                  |                                 |                          | <b>\$827,249,455</b>   |                       | <b>\$626,445,680</b>   | <b>\$1,453,695,135</b> |
| <b>ESCALATION</b>                                         | <b>3 Years @</b> | <b>2.50%</b>                    |                          | <b>\$62,044,000</b>    |                       | <b>\$46,983,000</b>    | <b>\$109,027,000</b>   |
| <b>ESCALATED CONSTRUCTION COST</b>                        |                  |                                 |                          | <b>\$889,293,455</b>   |                       | <b>\$673,428,680</b>   | <b>\$1,562,722,135</b> |
| <b>Mark-Up</b>                                            | <b>10.0%</b>     | <b>of Est. Labor &amp; Mat.</b> |                          | <b>\$88,929,000</b>    |                       | <b>\$67,343,000</b>    | <b>\$156,272,000</b>   |
| <b>ESTIMATED PROJ COST</b>                                |                  |                                 |                          | <b>\$978,222,455</b>   |                       | <b>\$740,771,680</b>   | <b>\$1,718,994,135</b> |
| <b>STATE SALES TAX</b>                                    | <b>5.5%</b>      | <b>of Materials</b>             |                          | <b>\$53,802,000</b>    |                       |                        | <b>\$53,802,000</b>    |
| <b>ROW ACQUISITION</b>                                    | <b>\$0</b>       | <b>per Mile</b>                 |                          |                        |                       |                        | <b>\$0</b>             |
| <b>MITIGATION</b>                                         |                  |                                 |                          |                        |                       |                        | <b>\$0</b>             |
| <b>TOPOGRAPHIC SURVEYING/SOIL EXPLORATION @ 40,000/mi</b> |                  |                                 |                          |                        |                       |                        | <b>\$5,875,030</b>     |
| <b>ENGINEERING AND CONSTRUCTION MANAGEMENT</b>            |                  |                                 |                          |                        |                       |                        | <b>\$34,379,883</b>    |
| <b>CONTINGENCY</b>                                        | <b>14.46%</b>    | <b>of project cost</b>          |                          |                        |                       |                        | <b>\$254,387,412</b>   |
| <b>ESTIMATED TOTAL PROJ COST</b>                          |                  |                                 |                          |                        |                       |                        | <b>\$2,067,438,460</b> |
| <b>UNDERGROUND PROJECT TOTAL</b>                          |                  |                                 |                          |                        |                       | <b>(rounded)</b>       | <b>\$2,067,400,000</b> |

**Black & Veatch**Owner **Avangrid**Project **NECEC**

B&amp;V File No. 400319.42.3000

Assumptions - Underground Cost Estimate, Underground Alternate Route

General

- 1 The estimate is based on a 320 kV DC Cable installation 146.88 miles long.
- 2 ROW acquisition costs are not included in the estimate.
- 3 Environmental mitigation costs are not included in the estimate.
- 4 The estimate does not include costs related to contaminated or hazardous soils or water.
- 5 The estimate does not include allowances for existing facility relocations.
- 6 The estimate does not include allowances for work hour/location restrictions.
- 7 The estimate is in 2019 dollars and includes escalation at 2.5% for 3 years.
- 8 The estimate includes a 10% mark-up for a prime contractor
- 9 The estimate includes a 14.46% contingency
- 9 The estimate includes sales tax of 5.5% on materials only.

Cable & Accessories

- 10 The estimate assumes a single +/-320kV DC circuit with 2 cables per pole.
- 11 The cables are estimated as 320kV DC, 2500 sq. mm Cu Cable.
- 12 The estimate includes an installed spare cable the full length of the project.
- 13 The estimate includes (10) AIS cable terminations, including 2 spare terminations.
- 14 The estimate includes (2,340) single-phase cable joints, with 12 spare joints.
- 15 The estimate does not include surge arrestors.
- 16 The estimate does not include optical fiber cable inside the power cable for temperature monitoring.

Communications

- 17 The estimate includes two fiber optic cables for communications and monitoring.
- 18 Fiber-optic cables are estimated as 48 fiber, single mode, loose tube outdoor cable.
- 19 Fiber-optic cables are installed into 1 1/4" HDPE innerducts installed in 4" PVC conduit.
- 20 Separate pull/splicing boxes are included for the fiber-optics.

Temperature Monitoring

- 21 The estimate does not include cable temperature monitoring equipment.

Overhead to Underground Transition

- 22 The estimate does not include termination stations or supports.
- 23 The estimate does not include provisions for overhead transmission connections
- 24 The estimate does not include concrete encased sweeps for the cable

Splice Housings

- 25 The estimate includes (780) 33"x8"x10' precast concrete splice vaults.
- 26 Each splice housing is assumed to hold (3) splices

Duct Bank Installation

- 27 The estimate includes 53.8 miles of duct bank.
- 28 The estimate includes (6)8" SCH 40 PVC Conduits for high voltage cable include one spare conduits.
- 29 The estimate includes (2) 4" SCH 40 PVC Conduits for communications.
- 30 The conduits are installed in a common duct bank, 3' wide and 2' high
- 31 The estimate assumes ductbank installation will be under pavement.
- 32 The estimate includes traffic control at 200ft/day.
- 33 The estimate includes soil erosion and sediment control measures for rural streets.
- 34 The estimate assumes a 3' wide trench, averaging 6' deep.
- 35 The estimate assumes the ductbank will be backfilled with FTB to 2' below grade.
- 36 The estimate includes pavement removal and restoration for the entire route length.
- 37 The estimate includes allowance for dewatering for 50% of the trench.
- 38 The estimate includes sheeting and shoring of the trench for 25% of the route length.

Direct Buried Installation

- 39 The estimate includes 60.2 miles of direct buried installation.
- 40 The estimate does not include conduits in the direct buried sections.
- 41 The estimate includes soil erosion and sediment control measures for green spaces.
- 42 The cables are installed in a single 5' wide trench averaging 7' deep.
- 43 The cables are installed in a thermal sand cable bedding material
- 44 The estimate includes a 9" thick concrete cap installed 18" below grade
- 45 The estimate assumes backfilling direct buried sections with native soils.
- 46 The estimate includes vegetation clearing and restoration 50' wide for construction not in roadways.
- 47 The estimate includes allowance for dewatering for 50% of the trench in uplands, and 100% in wetlands.
- 48 The estimate does not include shoring for the trenches.

HDD Installation

- 49 The estimate includes (150) sets of HDD installations in soil, 1000 feet long each.
- 50 Each HDD installation consists of the bundled FPVC or HDPE conduits pulled directly into the boreholes.
- 51 The HDD installations do not include a casing.
- 52 The HDD installations do not include grouting of the bore hole.

Engineering & Construction Management

- 53 The estimate includes surveying, and soil exploration.
- 54 The estimate includes approximate engineering costs.
- 55 The estimate includes approximately construction management costs.





Owner **Avangrid** Computed By **J. Bardwell**  
 Project **NECEC**  
 B&V File No. 400319.42.3000  
 Title **Underground Cost Estimate, Appalachian Trail**  
 Estimate Overall Route Length **1.00 Miles** **1 DC Circuits**  
**5,280 Feet** **2 Splices per Circuit** **2 Cables per Pole**

| Item                                                      | Qty              | Unit                            | Material<br>Unit<br>Cost | Total<br>Mat'l<br>Cost | Labor<br>Unit<br>Cost | Total<br>Labor<br>Cost | TOTAL<br>COST       |
|-----------------------------------------------------------|------------------|---------------------------------|--------------------------|------------------------|-----------------------|------------------------|---------------------|
| <b>CABLE SYSTEM FURNISH AND INSTALL</b>                   |                  |                                 |                          |                        |                       |                        |                     |
| <b>UG CABLE AND ACCESSORIES SUBTOTAL</b>                  |                  |                                 |                          | <b>\$5,018,700</b>     |                       | <b>\$1,430,000</b>     | <b>\$6,448,700</b>  |
| <b>COMMUNICATIONS</b>                                     |                  |                                 |                          |                        |                       |                        |                     |
| <b>CABLE SYSTEM COMMUNICATIONS (FO) SUBTOTAL</b>          |                  |                                 |                          | <b>\$45,980</b>        |                       | <b>\$55,748</b>        | <b>\$101,728</b>    |
| <b>CIVIL WORK</b>                                         |                  |                                 |                          |                        |                       |                        |                     |
| <b>GENERAL SUBTOTAL</b>                                   |                  |                                 |                          | <b>\$100,000</b>       |                       | <b>\$162,500</b>       | <b>\$262,500</b>    |
| <b>OVERHEAD TO UNDERGROUND SUBTOTAL</b>                   |                  |                                 |                          | <b>\$433,123</b>       |                       | <b>\$662,510</b>       | <b>\$1,095,633</b>  |
| <b>SPLICING VAULT SUBTOTAL</b>                            |                  |                                 |                          | <b>\$209,000</b>       |                       | <b>\$474,000</b>       | <b>\$683,000</b>    |
| <b>DUCTBANK INSTALLATION</b>                              |                  |                                 |                          | <b>\$192,175</b>       |                       | <b>\$552,181</b>       | <b>\$744,357</b>    |
| Ductbank cost per route foot                              | \$418.18         |                                 |                          |                        |                       |                        |                     |
| <b>HDD INSTALLATION SUBTOTAL</b>                          |                  |                                 |                          | <b>\$1,893,000</b>     |                       | <b>\$5,234,000</b>     | <b>\$7,127,000</b>  |
| HDD Ductbank cost per route foot(1 Bores))                | \$2,036.29       |                                 |                          |                        |                       |                        |                     |
| <b>ESTIMATED LABOR &amp; MATERIAL COST</b>                |                  |                                 |                          | <b>\$7,891,978</b>     |                       | <b>\$8,570,939</b>     | <b>\$16,462,917</b> |
| <b>ESCALATION</b>                                         | <b>3 Years @</b> | <b>2.50%</b>                    |                          | <b>\$592,000</b>       |                       | <b>\$643,000</b>       | <b>\$1,235,000</b>  |
| <b>ESCALATED CONSTRUCTION COST</b>                        |                  |                                 |                          | <b>\$8,483,978</b>     |                       | <b>\$9,213,939</b>     | <b>\$17,697,917</b> |
| <b>Mark-Up</b>                                            | <b>10.0%</b>     | <b>of Est. Labor &amp; Mat.</b> |                          | <b>\$848,000</b>       |                       | <b>\$921,000</b>       | <b>\$1,769,000</b>  |
| <b>ESTIMATED PROJ COST</b>                                |                  |                                 |                          | <b>\$9,331,978</b>     |                       | <b>\$10,134,939</b>    | <b>\$19,466,917</b> |
| <b>STATE SALES TAX</b>                                    | <b>5.5%</b>      | <b>of Materials</b>             |                          | <b>\$513,000</b>       |                       |                        | <b>\$513,000</b>    |
| <b>ROW ACQUISITION</b>                                    |                  | <b>\$0 per Mile</b>             |                          |                        |                       |                        | <b>\$0</b>          |
| <b>MITIGATION</b>                                         |                  |                                 |                          |                        |                       |                        | <b>\$0</b>          |
| <b>TOPOGRAPHIC SURVEYING/SOIL EXPLORATION @ 40,000/mi</b> |                  |                                 |                          |                        |                       |                        | <b>\$40,000</b>     |
| <b>ENGINEERING AND CONSTRUCTION MANAGEMENT</b>            |                  |                                 |                          |                        |                       |                        | <b>\$2,920,038</b>  |
| <b>CONTINGENCY</b>                                        | <b>30.00%</b>    | <b>of project cost</b>          |                          |                        |                       |                        | <b>\$6,881,986</b>  |
| <b>ESTIMATED TOTAL PROJ COST</b>                          |                  |                                 |                          |                        |                       |                        | <b>\$29,821,941</b> |
| <b>UNDERGROUND PROJECT TOTAL</b>                          |                  |                                 |                          |                        | <b>(rounded)</b>      |                        | <b>\$29,800,000</b> |

**Black & Veatch**Owner **Avangrid**Project **NECEC**

B&amp;V File No. 400319.42.3000

Assumptions - Underground Cost Estimate, Appalachian Trail

General

- 1 The estimate is based on a 320 kV DC Cable installation 146.88 miles long.
- 2 ROW acquisition costs are not included in the estimate.
- 3 Environmental mitigation costs are not included in the estimate.
- 4 The estimate does not include costs related to contaminated or hazardous soils or water.
- 5 The estimate does not include allowances for existing facility relocations.
- 6 The estimate does not include allowances for work hour/location restrictions.
- 7 The estimate is in 2019 dollars and includes 3 years of escalation at 2.5%
- 8 The estimate includes a 10% allowance for prime contractor mark-up.
- 9 The estimate includes a 30% contingency to account for potential rock variation.
- 9 The estimate includes sales tax of 5.5% on materials only.

Cable & Accessories

- 10 The estimate assumes a single +/-320kV DC circuit with 1 cable per pole.
- 11 The cables are estimated as 320kV DC, 2500 sq. mm Cu Cable.
- 12 The estimate includes an installed spare cable the full length of the line.
- 13 The estimate includes (6) AIS cable terminations, and 2 spare terminations.
- 14 The estimate includes (9) single-phase cable joints, with 2 spare joints.
- 15 The estimate does not include surge arrestors.
- 16 The estimate does not include optical fiber cable inside the power cable for temperature monitoring.

Communications

- 17 The estimate includes two fiber optic cable systems.
- 18 Fiber-optic cables are estimated as 48 fiber, single mode, loose tube outdoor cable.
- 19 Fiber-optic cables are installed into 1 1/4" HDPE innerducts installed in 4" PVC conduit.
- 20 Separate pull/splicing boxes are included for the fiber-optics.

Temperature Monitoring

- 21 The estimate does not include cable temperature monitoring equipment.

Overhead to Underground Transition

- 22 Includes terminations stands, surge arrestor stands and dead-ends for the overhead lines
- 23 The estimate includes site work and foundations for two 135' square termination station
- 24 The estimate includes ground grid and fencing for two 135' square terminations station.

Splice Housings

- 25 The estimate includes (3) jointing locations with (3) 12'x4'x3' precast concrete splice housings at each location.
- 26 Each splice housing is assumed to hold (1) splice.

Duct Bank Installation

- 27 The estimate includes 1,700 feet of duct bank.
- 28 The estimate includes (6)8" SCH 40 PVC Conduits for high voltage cable include one spare conduits.
- 29 The estimate includes (2) 4" SCH 40 PVC Conduits for communications.
- 30 The conduits are installed in a common duct bank, 3' wide and 2' high
- 31 The estimate assumes ductbank installation will be under pavement.
- 32 The estimate includes traffic control at 200ft/day.
- 33 The estimate includes soil erosion and sediment control measures for rural streets.
- 34 The estimate assumes a 3' wide trench, averaging 6' deep.
- 35 The estimate assumes the ductbank will be backfilled with F7B to 2' below grade.
- 36 The estimate includes pavement removal and restoration for the entire route length.
- 37 The estimate includes allowance for dewatering for 50% of the trench.
- 38 The estimate includes sheeting and shoring of the trench for 25% of the route length.

HDD Installation

- 39 The estimate includes (1) HDD installation in mixed soil and rock, 3500 feet long.
- 40 Each HDD installation consists of the bundled FPVC or HDPE conduits pulled directly into the boreholes.
- 41 The estimate includes erection of noise barriers around the HDD sites.
- 42 The HDD installations do not include a casing.
- 43 The HDD installations do not include grouting of the bore hole.

Engineering & Construction Management

- 44 The estimate includes surveying, and soil exploration.
- 45 The estimate includes approximate engineering costs.
- 46 The estimate includes approximate construction management costs.



Owner **Avangrid** Computed By **J. Bardwell**  
 Project **NECEC**  
 B&V File No. 400319.42.3000  
 Title **Underground Cost Estimate, Beattie Pond**  
 Estimate Overall Route Length **1.20 Miles** 1 DC Circuits  
**6,336 Feet** 3 Splices per Circuit 1 Cables per Pole

| Item                                                      | Qty              | Unit                            | Material<br>Unit<br>Cost | Total<br>Mat'l<br>Cost | Labor<br>Unit<br>Cost | Total<br>Labor<br>Cost | TOTAL<br>COST       |
|-----------------------------------------------------------|------------------|---------------------------------|--------------------------|------------------------|-----------------------|------------------------|---------------------|
| <b>CABLE SYSTEM FURNISH AND INSTALL</b>                   |                  |                                 |                          |                        |                       |                        |                     |
| <b>UG CABLE AND ACCESSORIES SUBTOTAL</b>                  |                  |                                 |                          | <b>\$3,571,600</b>     |                       | <b>\$991,800</b>       | <b>\$4,563,400</b>  |
| <b>COMMUNICATIONS</b>                                     |                  |                                 |                          |                        |                       |                        |                     |
| <b>CABLE SYSTEM COMMUNICATIONS (FO) SUBTOTAL</b>          |                  |                                 |                          | <b>\$57,616</b>        |                       | <b>\$68,777</b>        | <b>\$126,393</b>    |
| <b>CIVIL WORK</b>                                         |                  |                                 |                          |                        |                       |                        |                     |
| <b>GENERAL SUBTOTAL</b>                                   |                  |                                 |                          | <b>\$100,000</b>       |                       | <b>\$165,000</b>       | <b>\$265,000</b>    |
| <b>OVERHEAD TO UNDERGROUND SUBTOTAL</b>                   |                  |                                 |                          | <b>\$386,699</b>       |                       | <b>\$577,662</b>       | <b>\$964,361</b>    |
| <b>SPLICING VAULT SUBTOTAL</b>                            |                  |                                 |                          | <b>\$108,750</b>       |                       | <b>\$169,500</b>       | <b>\$278,250</b>    |
| <b>DIRECT BURIED</b>                                      |                  |                                 |                          | <b>\$252,575</b>       |                       | <b>\$1,288,255</b>     | <b>\$1,540,830</b>  |
| Direct Buried cost per route foot                         | 3355.36          |                                 |                          |                        |                       |                        |                     |
| <b>HDD INSTALLATION SUBTOTAL</b>                          |                  |                                 |                          | <b>\$289,000</b>       |                       | <b>\$1,062,000</b>     | <b>\$1,351,000</b>  |
| HDD Ductbank cost per route foot(1 Bores))                | 675.50           |                                 |                          |                        |                       |                        |                     |
| <b>ESTIMATED LABOR &amp; MATERIAL COST</b>                |                  |                                 |                          | <b>\$4,766,240</b>     |                       | <b>\$4,322,994</b>     | <b>\$9,089,235</b>  |
| <b>ESCALATION</b>                                         | <b>3 Years @</b> | <b>2.50%</b>                    |                          | <b>\$357,000</b>       |                       | <b>\$324,000</b>       | <b>\$681,000</b>    |
| <b>ESCALATED CONSTRUCTION COST</b>                        |                  |                                 |                          | <b>\$5,123,240</b>     |                       | <b>\$4,646,994</b>     | <b>\$9,770,235</b>  |
| <b>Mark-Up</b>                                            | <b>10.0%</b>     | <b>of Est. Labor &amp; Mat.</b> |                          | <b>\$512,000</b>       |                       | <b>\$465,000</b>       | <b>\$977,000</b>    |
| <b>ESTIMATED PROJ COST</b>                                |                  |                                 |                          | <b>\$5,635,240</b>     |                       | <b>\$5,111,994</b>     | <b>\$10,747,235</b> |
| <b>STATE SALES TAX</b>                                    | <b>5.5%</b>      | <b>of Materials</b>             |                          | <b>\$310,000</b>       |                       |                        | <b>\$310,000</b>    |
| <b>ROW ACQUISITION</b>                                    |                  | <b>\$0 per Mile</b>             |                          |                        |                       |                        | <b>\$0</b>          |
| <b>MITIGATION</b>                                         |                  |                                 |                          |                        |                       |                        | <b>\$0</b>          |
| <b>TOPOGRAPHIC SURVEYING/SOIL EXPLORATION @ 40,000/mi</b> |                  |                                 |                          |                        |                       |                        | <b>\$48,000</b>     |
| <b>ENGINEERING AND CONSTRUCTION MANAGEMENT</b>            |                  |                                 |                          |                        |                       |                        | <b>\$1,612,085</b>  |
| <b>CONTINGENCY</b>                                        | <b>20.0%</b>     | <b>of project cost</b>          |                          |                        |                       |                        | <b>\$2,543,464</b>  |
| <b>ESTIMATED TOTAL PROJ COST</b>                          |                  |                                 |                          |                        |                       |                        | <b>\$15,260,784</b> |
| <b>UNDERGROUND PROJECT TOTAL</b>                          |                  |                                 |                          |                        | <b>(rounded)</b>      |                        | <b>\$15,300,000</b> |



**Black & Veatch**Owner **Avangrid**Project **NECEC**

B&amp;V File No. 400319.42.3000

Assumptions - Underground Cost Estimate, Beattie Pond

General

- 1 The estimate is based on a 320 kV DC Cable installation 146.88 miles long.
- 2 ROW acquisition costs are not included in the estimate.
- 3 Environmental mitigation costs are not included in the estimate.
- 4 The estimate does not include costs related to contaminated or hazardous soils or water.
- 5 The estimate does not include allowances for existing facility relocations.
- 6 The estimate does not include allowances for work hour/location restrictions.
- 7 The estimate is in 2019 dollars and includes 3 years of escalation at 2.5%
- 8 The estimate includes a 10% allowance for prime contractor mark-up.
- 9 The estimate includes a 20% contingency.
- 9 The estimate includes sales tax of 5.5% on materials only.

Cable & Accessories

- 10 The estimate assumes a single +/-320kV DC circuit with 1 cable per pole.
- 11 The cables are estimated as 320kV DC, 2500 sq. mm Cu Cable.
- 12 The estimate includes an installed spare cable the full length of the line.
- 13 The estimate includes (6) AIS cable terminations, and 2 spare terminations.
- 14 The estimate includes (9) single-phase cable joints, with 2 spare joints.
- 15 The estimate does not include surge arrestors.
- 16 The estimate does not include optical fiber cable inside the power cable for temperature monitoring.

Communications

- 17 The estimate includes two fiber optic cable systems.
- 18 Fiber-optic cables are estimated as 48 fiber, single mode, loose tube outdoor cable.
- 19 Fiber-optic cables are installed into 1 1/4" HDPE innerducts installed in 4" PVC conduit.
- 20 Separate pull/splicing boxes are included for the fiber-optics.

Temperature Monitoring

- 21 The estimate does not include cable temperature monitoring equipment.

Overhead to Underground Transition

- 22 Includes terminations stands, surge arrestor stands and dead-ends for the overhead lines
- 23 The estimate includes site work and foundations for two 135' square termination station
- 24 The estimate includes ground grid and fencing for two 135' square terminations station.

Splice Housings

- 25 The estimate includes (3) jointing locations with (3) 12'x4'x3' precast concrete splice housings at each location.
- 26 Each splice housing is assumed to hold (1) splice.

Duct Bank Installation

- 27 The estimate does not include duct bank.

Direct Buried Installation

- 28 The estimate does not include conduits in the direct buried sections.
- 29 The estimate includes soil erosion and sediment control measures for green spaces.
- 30 The cables are installed in a single 5' wide trench averaging 7' deep.
- 31 The cables are installed in a thermal sand cable bedding material
- 32 The estimate includes a 9" thick concrete cap installed 18" below grade
- 33 The estimate assumes backfilling direct buried sections with native soils.
- 34 The estimate includes vegetation clearing and restoration 75' wide for construction not in roadways.
- 35 The estimate includes allowance for dewatering for 50% of the trench in uplands, and 100% in wetlands.
- 36 The estimate does not include shoring for the trenches.

HDD Installation

- 37 The estimate includes (2) sets of HDD installations in soil, 1000 feet long each.
- 38 Each HDD installation consists of the bundled FPVC or HDPE conduits pulled directly into the boreholes.
- 39 The HDD installations do not include a casing.
- 40 The HDD installations do not include grouting of the bore hole.

Engineering & Construction Management

- 41 The estimate includes surveying, and soil exploration.
- 42 The estimate includes approximate engineering costs.
- 43 The estimate includes approximate construction management costs.



Owner **Avangrid**  
 Project **NECEC**  
 B&V File No. 400319.42.3000  
 Title **Underground Cost Estimate, Gold Brook**  
 Estimate Overall Route Length **1.15 Miles**  
**6,072 Feet**

Computed By **J. Bardwell**

Checked By

**1 DC Circuits**  
**2 Cables per Pole**

**3 Splices per Circuit**

| Item                                                      | Qty              | Unit                            | Material<br>Unit<br>Cost | Total<br>Mat'l<br>Cost | Labor<br>Unit<br>Cost | Total<br>Labor<br>Cost | TOTAL<br>COST       |
|-----------------------------------------------------------|------------------|---------------------------------|--------------------------|------------------------|-----------------------|------------------------|---------------------|
| <b>CABLE SYSTEM FURNISH AND INSTALL</b>                   |                  |                                 |                          |                        |                       |                        |                     |
| <b>UG CABLE AND ACCESSORIES SUBTOTAL</b>                  |                  |                                 |                          | <b>\$5,591,200</b>     |                       | <b>\$1,125,000</b>     | <b>\$6,716,200</b>  |
| <b>COMMUNICATIONS</b>                                     |                  |                                 |                          |                        |                       |                        |                     |
| <b>CABLE SYSTEM COMMUNICATIONS (FO) SUBTOTAL</b>          |                  |                                 |                          | <b>\$56,032</b>        |                       | <b>\$66,861</b>        | <b>\$122,893</b>    |
| <b>CIVIL WORK</b>                                         |                  |                                 |                          |                        |                       |                        |                     |
| <b>GENERAL SUBTOTAL</b>                                   |                  |                                 |                          | <b>\$100,000</b>       |                       | <b>\$164,375</b>       | <b>\$264,375</b>    |
| <b>OVERHEAD TO UNDERGROUND SUBTOTAL</b>                   |                  |                                 |                          | <b>\$495,436</b>       |                       | <b>\$903,619</b>       | <b>\$1,399,054</b>  |
| <b>SPLICING VAULT SUBTOTAL</b>                            |                  |                                 |                          | <b>\$128,750</b>       |                       | <b>\$219,500</b>       | <b>\$348,250</b>    |
| <b>DUCTBANK INSTALLATION - ROADWAY</b>                    |                  |                                 |                          | <b>\$34,867</b>        |                       | <b>\$92,077</b>        | <b>\$126,943</b>    |
| Ductbank cost per route foot                              | \$466.70         |                                 |                          |                        |                       |                        |                     |
| <b>HDD INSTALLATION SUBTOTAL</b>                          |                  |                                 |                          | <b>\$1,628,200</b>     |                       | <b>\$8,773,600</b>     | <b>\$10,401,800</b> |
| HDD Ductbank cost per route foot(1 Bores))                | \$1,793.41       |                                 |                          |                        |                       |                        |                     |
| <b>ESTIMATED LABOR &amp; MATERIAL COST</b>                |                  |                                 |                          | <b>\$8,034,484</b>     |                       | <b>\$11,345,031</b>    | <b>\$19,379,515</b> |
| <b>ESCALATION</b>                                         | <b>3 Years @</b> | <b>2.50%</b>                    |                          | <b>\$603,000</b>       |                       | <b>\$851,000</b>       | <b>\$1,454,000</b>  |
| <b>ESCALATED CONSTRUCTION COST</b>                        |                  |                                 |                          | <b>\$8,637,484</b>     |                       | <b>\$12,196,031</b>    | <b>\$20,833,515</b> |
| <b>Mark-Up</b>                                            | <b>10.0%</b>     | <b>of Est. Labor &amp; Mat.</b> |                          | <b>\$864,000</b>       |                       | <b>\$1,220,000</b>     | <b>\$2,084,000</b>  |
| <b>ESTIMATED PROJ COST</b>                                |                  |                                 |                          | <b>\$9,501,484</b>     |                       | <b>\$13,416,031</b>    | <b>\$22,917,515</b> |
| <b>STATE SALES TAX</b>                                    | <b>5.5%</b>      | <b>of Materials</b>             |                          | <b>\$523,000</b>       |                       |                        | <b>\$523,000</b>    |
| <b>ROW ACQUISITION</b>                                    |                  | <b>\$0 per Mile</b>             |                          |                        |                       |                        | <b>\$0</b>          |
| <b>MITIGATION</b>                                         |                  |                                 |                          |                        |                       |                        | <b>\$0</b>          |
| <b>TOPOGRAPHIC SURVEYING/SOIL EXPLORATION @ 40,000/mi</b> |                  |                                 |                          |                        |                       |                        | <b>\$46,000</b>     |
| <b>ENGINEERING AND CONSTRUCTION MANAGEMENT</b>            |                  |                                 |                          |                        |                       |                        | <b>\$2,291,752</b>  |
| <b>CONTINGENCY</b>                                        | <b>30.0%</b>     | <b>of project cost</b>          |                          |                        |                       |                        | <b>\$7,733,480</b>  |
| <b>ESTIMATED TOTAL PROJ COST</b>                          |                  |                                 |                          |                        |                       |                        | <b>\$33,511,747</b> |
| <b>UNDERGROUND PROJECT TOTAL</b>                          |                  |                                 |                          |                        | <b>(rounded)</b>      |                        | <b>\$33,500,000</b> |

**Black & Veatch**Owner **Avangrid**Project **NECEC**

B&amp;V File No. 400319.42.3000

Assumptions - Underground Cost Estimate, Gold Brook

General

- 1 The estimate is based on a 320 kV DC Cable installation 146.88 miles long.
- 2 ROW acquisition costs are not included in the estimate.
- 3 Environmental mitigation costs are not included in the estimate.
- 4 The estimate does not include costs related to contaminated or hazardous soils or water.
- 5 The estimate does not include allowances for existing facility relocations.
- 6 The estimate does not include allowances for work hour/location restrictions.
- 7 The estimate is in 2019 dollars and includes 3 years of escalation at 2.5%
- 8 The estimate includes a 10% allowance for prime contractor mark-up.
- 9 The estimate includes a 30% contingency to account for the potential rock in the area.
- 9 The estimate includes sales tax of 5.5% on materials only.

Cable & Accessories

- 10 The estimate assumes a single +/-320kV DC circuit with 2 cables per pole.
- 11 The cables are estimated as 320kV DC, 2500 sq. mm Cu Cable.
- 12 The estimate includes an installed spare cable the full length of the line.
- 13 The estimate includes (10) AIS cable terminations, and 2 spare terminations.
- 14 The estimate includes (15) single-phase cable joints, with 2 spare joints.
- 15 The estimate does not include surge arrestors.
- 16 The estimate does not include optical fiber cable inside the power cable for temperature monitoring.

Communications

- 17 The estimate includes two fiber optic cable systems.
- 18 Fiber-optic cables are estimated as 48 fiber, single mode, loose tube outdoor cable.
- 19 Fiber-optic cables are installed into 1 1/4" HDPE innerducts installed in 4" PVC conduit.
- 20 Separate pull/splicing boxes are included for the fiber-optics.

Temperature Monitoring

- 21 The estimate does not include cable temperature monitoring equipment.

Overhead to Underground Transition

- 22 Includes terminations stands, surge arrestor stands and dead-ends for the overhead lines
- 23 The estimate includes site work and foundations for two 135' square termination station
- 24 The estimate includes ground grid and fencing for two 135' square terminations station.

Splice Housings

- 25 The estimate includes (3) jointing locations with (3) 12'x4'x3' precast concrete splice housings at each location.
- 26 Each splice housing is assumed to hold (1) splice.

Duct Bank Installation

- 27 The estimate includes 300 feet of duct bank.
- 28 The estimate includes (6) 8" SCH 40 PVC Conduits for high voltage cable include one spare conduits.
- 29 The estimate includes (2) 4" SCH 40 PVC Conduits for communications.
- 30 The conduits are installed in a common duct bank, 3' wide and 2' high
- 31 The estimate assumes ductbank installation will be under pavement.
- 32 The estimate includes traffic control at 200ft/day.
- 33 The estimate includes soil erosion and sediment control measures for rural streets.
- 34 The estimate assumes a 3' wide trench, averaging 6' deep.
- 35 The estimate assumes the ductbank will be backfilled with FTB to 2' below grade.
- 36 The estimate includes pavement removal and restoration for the entire route length.
- 37 The estimate includes allowance for dewatering for 50% of the trench.
- 38 The estimate includes sheeting and shoring of the trench for 25% of the route length.

HDD Installation

- 39 The estimate includes (2) sets of HDD installations in soil, with a combined length of 5,800 feet.
- 40 Each HDD installation consists of the bundled FPVC or HDPE conduits pulled directly into the boreholes.
- 41 The HDD installations do not include a casing.
- 42 The HDD installations do not include grouting of the bore hole.

Engineering & Construction Management

- 43 The estimate includes surveying, and soil exploration.
- 44 The estimate includes approximate engineering costs.
- 45 The estimate includes approximate construction management costs.





STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED REBUTTAL TESTIMONY OF  
GARY EMOND

March 25, 2019

Regarding

- Issue 2: Wildlife Habitat and Fisheries, Habitat Fragmentation
  - Responsive to Intervenor Group 4 witness Aram Calhoun

## **WITNESS QUALIFICATIONS (Relevant to DEP Review)**

I have 25 years of experience as a project manager and environmental scientist with extensive knowledge of large energy infrastructure routing and siting, natural resource impact assessment, field studies and surveys, and environmental permitting. I am experienced in managing multidisciplinary projects, designing, coordinating, conducting, and managing field studies, writing reports, and preparing permit applications at the federal, state, and local levels. My scientific expertise encompasses vernal pools, wetlands, stream habitat, special status species, wildlife and fisheries, and vegetation. I have been professionally assessing and mapping vernal pools since 2002 in Massachusetts, and have done so in Maine since 2007.

My CV is attached as Exhibit CMP-12-A.

### **I. Discussion (Relevant to DEP Review)**

Dr. Calhoun makes statements in her testimony regarding emigration routes and staging areas, and allegedly unreasonable adverse effects of the proposed Project on vernal pools.

Examples include:

- Page 11: “In the only peer-reviewed study addressing power line behavior of wood frog juveniles in a controlled experiment, deMaynadier and Hunter (1999) showed that juvenile wood frogs showed an emigration preference for closed-canopy habitat immediately upon metamorphosis, with the highest sampling rates occurring in microhabitats characterized by dense foliage in both the understory and canopy layers. Their results suggest populations of pool- breeding amphibians in vernal pools will likely decline due to fragmentation from power lines.”
- Page 12: “Shrubby habitat that has an understory of thick graminoids may be difficult

for dispersing amphibians to pass through on their way to forested habitat.”

- Page 13: “will result in impacts ranging from devastation for some individual vernal pools to greatly compromised habitat for others”; “There are many factors affecting the resiliency of pool-breeding amphibians in the face of land conversion and many are undocumented or only explained by complex interactions of other environmental factors”.
- Page 14: “What we do know is that populations along the corridor will be compromised, some lost, and some severely degraded. We know that significant numbers of animals will be directly impacted through operations”; “The proposed ROW will be a significant further stressor”.

Dr. Calhoun’s assertions are inconsistent with the results of extensive vernal pool assessment and mapping field surveys and data collection conducted during the springs of 2007 and 2008, associated with the Maine Power Reliability Program (MPRP) project permit applications. Those surveys were conducted in accordance with agency-approved protocol and were consistent with the requirements and recommended optimal indicator species survey times contained in the Natural Resources Protection Act (NRPA) rules chapter 335, Significant Wildlife Habitat. The vernal pool survey protocol followed for the MPRP remain best practices today and are in accordance with the 2014 Maine Association of Wetland Scientists Vernal Pool Survey Protocol used for the NECEC Project.

In those surveys, approximately 620 miles of right of way (ROW), the majority of which had been cleared of trees for 40 or more years, were observed and field-surveyed by biologists. The surveys were performed in eight biophysical regions (McMahon, 1990), including the Central Mountains, Western Foothills, Western Mountains, Central Interior, Penobscot Bay

Region, Southern Interior, Midcoast Region, and the South Coastal Region. Transmission corridors surveyed for the MPRP were typically a few hundred feet wide or less, and many were adjacent to forested habitat. The following summary of these studies was presented in a white paper prepared by TRC Engineers, LLC for Central Maine Power Company (CMP) in March 2009, attached hereto as Exhibit CMP-12-B:

- 200 natural vernal pools were documented within or adjacent to the proposed MPRP transmission corridors.
- Of the 200 natural vernal pools, 88 (44 percent) qualified as significant vernal pools under Chapter 335. This fell in the middle of the Maine Department of Inland Fisheries and Wildlife's (DIFW's) anticipated range of 40 to 50 percent of all vernal pools assessed that would be expected to meet the regulatory definition of "significant."
- All 88 significant vernal pools were located either within or immediately adjacent to transmission corridors that had been maintained in an early-successional shrub-scrub habitat for 40 years or longer.
- 48 (55 percent) of these significant vernal pools' 250-foot critical terrestrial habitats were 51 to 75 percent non-forested, and 87.5 percent of the significant vernal pools' 250-foot critical terrestrial habitats were more than 25 percent non-forested (i.e., had less than 75 percent forested habitat).
- The majority of non-forested land uses within the significant vernal pools' 250-foot critical terrestrial habitats were transmission corridor.
- Habitat conditions permeable to amphibian migration, including the presence of leaf litter, coarse woody debris, mammal burrows, and herbaceous and shrub vegetation cover, were all documented in transmission corridors.

- Significant vernal pools were documented in transmission line corridors within the expected frequency range, and at a greater rate than shown in the DIFW database. Specifically, 44 percent of the natural vernal pools documented within or immediately adjacent to CMP transmission corridors met the regulatory definition of “significant.”
- The average percentage of non-forested land within the 250 critical terrestrial habitat of these significant vernal pools was 44 percent.
- Only 12.5 percent of these significant vernal pools had greater than 75 percent forest habitat cover with their 250-foot critical terrestrial habitat.
- Constructing and maintaining transmission line corridors does not negatively affect vernal pool hydro-period. (Vernal pool hydro-period refers to the duration and frequency of water being present in pools. Hydro-period, an essential element of amphibian breeding success, requires that suitable breeding habitat containing vernal pools must hold water long enough for amphibian larvae to complete their aquatic life phase (Skidds and Golet, 2005).)
- The early-successional (shrub and herbaceous vegetation) habitat associated with transmission line corridors is permeable to amphibian migration.
- The life span of the spotted salamander averages 15 to 20 years. The majority of these corridors have been in existence for 40 or more years, a period which therefore spans multiple generations of spotted salamander (*Ambystoma maculatum*). Literature indicates that mole salamanders (genus *Ambystoma*) have high pool spawning fidelity (i.e., over 90 percent of the time they return to spawn in the pools from which they hatched and emerged). The MPRP data strongly indicate that several generations of spotted



salamanders have successfully reproduced in these vernal pools. It is therefore logical to conclude that their offspring continue to breed in these pools.

- CMP’s management of vernal pools in transmission line corridors complies and is consistent with the significant vernal pool habitat management guidelines and goals contained in Chapter 335. Furthermore, CMP’s management of vernal pools as proposed in applications for the Project incorporates many of the management recommendations contained in Dr. Calhoun’s publication, “Best Development Practices: Conserving Pool-Breeding Amphibians in Residential and Commercial Developments in the Northeastern United States”. (Calhoun and Klemens.2002), including:
  - Minimize disturbed areas and protect down-gradient buffer areas to the extent practicable;
  - Minimize erosion by maintaining vegetation on steep slopes;
  - Avoid creating ruts and other artificial depressions that hold water. If ruts are created, refill to grade before leaving the site; and
  - Refill perc test holes to grade.

The above findings and proposals demonstrate that maintained transmission line ROWs are compatible with, coexist with, and support healthy and productive significant vernal pools, and do not result in fragmentation. The NECEC will be constructed and the ROW maintained in accordance with NECEC-specific protective measures, restrictions, and guidelines and will support significant vernal pools similar to other transmission line ROWs in Maine, many of which have existed for multiple decades.

On page 14 of her direct testimony, in response to a request for her opinion of CMP’s proposed compensation for vernal pool impacts, Dr. Calhoun states, “In reviewing the data sheet

for state pool designation, I have concerns about 23 of the pools which are stated to be non-significant or only potentially significant.” First, the vernal pool determinations were peer-reviewed under the direction of MDEP, and the information submitted in support of the compensation plan was based on the peer-reviewed data. Second, in accordance with standard protocol, CMP submitted NECEC Project vernal pool survey data to DIFW for their review and determination of “significance.” DIFW, not CMP, made the determinations of the pools labeled “non-significant.” Finally, for purposes of the NECEC Project applications, and to be as protective as possible, those vernal pools identified by DIFW as “potentially significant vernal pools” were treated as significant vernal pools and included in impact calculations and in the Project’s compensation plan.

On page 15, Dr. Calhoun states: “Hence it is risky assessing pool quality based on egg mass abundances over short time periods (i.e., less than 5 years),” and “Assessments of vernal pools for state Significance for fairy shrimp and state-listed species are problematic in that survey times for these animals often do not overlap with survey times for amphibians.” However, all vernal pool surveys for the NECEC Project were conducted in accordance with protocols and procedures developed by the Maine Association of Wetland Scientists in coordination with DIFW, and these surveys complied with the requirements and recommended optimal survey times in DEP Chapter 335, Significant Wildlife Habitat rule.

On Page 16, Dr. Calhoun states “From an ecological perspective, the losses should be well-compensated, not undercompensated, given the level of uncertainty in actual pool numbers and given the level of uncalculated impacts to all vernal pools in the study area.” However, actual pool numbers were obtained by detailed and repeated ground surveys within the Project area as noted above. These pool locations and their significance (i.e., collected vernal pool data)

were considered in the NECEC transmission line siting and routing process, which sought to avoid and minimize impacts to all natural resources, including significant vernal pools. Therefore, there is no “uncertainty in actual pool numbers”, and no “uncalculated impacts” to vernal pools in the Project area. Although the survey corridor area for the NECEC was 500 feet wide for the new corridor portion and typically 300 to 500 feet wide for the proposed co-located portion, the actual maintained width of the proposed NECEC transmission line ROW will be 150 feet within the surveyed area. Furthermore, one reason for surveying a wide corridor rather than just the 150 feet of the final converted right of way is to allow for siting of the ROW, structure locations, and construction access around significant vernal pools as part of impact avoidance. This rerouting was done in multiple locations.

With regard to Dr. Calhoun’s statement about impacts being “undercompensated,” the Project ROW will be a “soft” land use that will be fully vegetated with shrubs, herbaceous plants, and small trees; this is distinct from, for example, an unvegetated road that promotes vehicular access and has little to no habitat value. In fact, the Project ROW will provide valuable vernal pool habitat, as evidenced by the MPRP vernal pool study results, and will not have an unreasonable impact on significant vernal pools or adverse effects to vernal pool species. This has been recognized by DIFW, which has agreed to the adequacy of CMP’s proposed in-lieu fee and proposal for conversion of vernal pool critical wetland and upland habitat from forested to early successional cover type. Thus, the proposed significant mitigation is appropriate and adequate.

## **II. Conclusion (Relevant to DEP Review)**

Based on the foregoing, including vernal pool survey data results associated with the MPRP, the NECEC will not result in fragmentation or adverse impacts to jurisdictional vernal

pools and vernal pool species within or adjacent to the proposed ROW. The NECEC ROW will be a “soft” land use that will remain vegetated with herbaceous plants, shrubs, and woody vegetation, including mature shrubs and small trees. Similar to other transmission line ROWs in Maine, the NECEC ROW will be surrounded by primarily working forested habitat. Thus, to the extent that vernal pool species benefit from forested habitat within a portion of their critical terrestrial habitat, this cover type will continue to be present and available.

Also similar to other transmission line ROWs in Maine, NECEC ROW maintenance activities will create and maintain habitat conditions permeable to amphibian migration, including the presence of leaf litter, coarse woody debris, mammal burrows, and herbaceous and shrub vegetation. CMP is proposing to implement protective measures and restrictions specific to vernal pools in its NECEC-specific Vegetation Clearing Plan (VCP) and post-construction Vegetation Maintenance Plan (VMP). Implementation of these plans will maintain healthy and productive significant vernal pools in and adjacent to the NECEC ROW.

As the MPRP Project vernal pool data demonstrate, maintained transmission line ROWs are compatible with and, in fact, coexist with and support healthy and productive significant vernal pools. Dr. Calhoun’s assertions on potential adverse effects of the NECEC Project on vernal pools are not supported by Maine-specific data or experience, as discussed above.

Exhibits:

CMP-12-A: Gary Emond CV

CMP-12-B: Position Paper on the Presence of Significant Vernal Pools in or Adjacent to Transmission Line Corridors

Dated: March 19, 2019

Respectfully submitted,

Gary Emond  
Gary Emond

STATE OF MAINE  
Cumberland, ss.

The above-named Gary Emond did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Before,

Dated: 3/19/19

Cindy Brouwer  
Notary Public Cindy Brouwer  
Name:  
My Commission Expires: 12/12/23

CINDY BROUWER  
Notary Public, Maine  
My Commission Expires December 12, 2023







## GARY EMOND

### ENVIRONMENTAL PROJECT MANAGER

#### YEARS OF EXPERIENCE

25

#### EDUCATION

- B.S., Environmental Studies (Terrestrial Ecosystems), University of Maine-Machias, 1994
- Graduate Studies, Soil Science, University of New Hampshire
- Graduate Studies, Environmental Engineering, University of Alaska

#### AREAS OF EXPERTISE

- Written and oral expert testimony
- Project management
- Transmission line routing and substation siting, associated permitting and licensing
- NEPA EIS and EA documents
- FERC hydro relicensing
- Wetland delineation and functional assessment
- Wildlife and fisheries assessment and management
- Vegetation sampling and habitat analysis
- Impact mitigation
- Federal, state and local environmental and land use permitting
- Public outreach relations

#### SPECIAL TRAINING

- OSHA 8-Hour Training
- Stream Restoration Natural Design
- FERC Environmental Training Seminar—Environmental Review & Compliance for Natural Gas Facilities

#### CERTIFICATION

- Certified Professional in Erosion and Sedimentation Control (CPESC)
- Professional Wetland Scientist #1305

#### AFFILIATIONS

- Maine Association of Wetland Scientists
- Society of Wetland Scientists
- The Wildlife Society

#### EXPERIENCE SUMMARY

Mr. Emond is a project manager and environmental scientist with extensive knowledge of routing and siting, resource impact assessment, field studies and surveys, and environmental permitting. He is experienced in managing multidisciplinary projects, designing, coordinating, conducting, and managing field studies, writing reports, and preparing permit applications at the federal, state, and local levels. Mr. Emond is experienced in the NEPA process, including the development of EISs and EAs, and FERC relicensing procedures applied to electrical transmission lines, natural gas pipelines, and hydroelectric facilities. His scientific expertise encompasses wetlands, stream habitat, special status species, wildlife and fisheries, and vegetation. Mr. Emond is also experienced in contract administration and budget development and management. He has extensive experience with projects in the northeast United States.

#### Sample Project Experience

##### AVANGRID, BES Program, Maine

Planned, performed, and managed vernal pools assessments and wetlands delineation and mapping for AVANGRID's BES Program in southern Maine. Surveys, assessments, and mapping were performed in approximately 100 miles of existing AVANGRID rights-of-way, and at multiple associated substation sites.

##### AVANGRID, NECEC, Maine

Planned and managed wetlands delineation and mapping for AVANGRID's proposed NECEC project. Surveys were performed in an approximately 50-mile, 500-foot-wide corridor extending to the Canadian border in western Maine.

##### Central Maine Power Company, Maine Power Reliability Program, Maine

Co-Environmental Project Manager for the Maine Power Reliability Program, an initiative to hundreds of miles of Central Maine Power's 345 kV, 115 kV, and 34.5 kV transmission lines. Designed, implemented, and managed all environmental routing, siting, and permitting studies (including vernal pools and wetlands) for the 345 and 115 kV transmission line corridor and 17 proposed substations. Managed the permitting effort for obtaining state and federal environmental permits, and worked closely with state and federal regulatory personnel to ensure the development of a thorough, robust, and complete application which would help reduce regulatory review time. Participated in the successful preparation and delivery of environmental permit applications to the Maine Department of Environmental Protection and the U.S. Army Corps of Engineers. Also provided expert written

testimony as part of the Maine Public Utilities review and approval process for the project.

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**Central Maine Power Company, Maguire Road Transmission Project, Southern Maine**

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Environmental Project Manager for a routing, siting, and permitting of a 30-mile 115 kV transmission line and an associated 115 and 345 kV switching station. This was a transmission reliability project which involved siting and constructing T&D facilities in a portion of Maine that is known to be rich in rare and uncommon wildlife and habitat resources. A GIS was used to evaluate eight different potential route options. Mr. Emond designed, implemented, participated in, and managed all environmental studies including vernal pool assessments and wetland delineation and mapping. , worked closely with local residents, NGOs, and state and federal regulatory and resource scientists, prepared all local, state, and federal applications, and successfully obtained environmental permits. In addition, Mr. Emond managed all construction compliance efforts.

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**Central Maine Power Company, Rumford IP 115 kV Substation Capacitor Bank and Line Position Addition, Maine**

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Permitting Specialist responsible for local permitting on this substation expansion project. Worked closely with the local codes enforcement officer and the Town of Rumford planning board to facilitate the application review process and public involvement, and to ensure the expedited procurement of the permit in order to keep the project construction schedule on track.

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**Central Maine Power Company, Section 174 69 kV Rebuild and Sections 55 & 58 69 kV Rebuild, Maine**

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Supervisory Environmental Specialist responsible for compliance of all federal, state, and local permit conditions for a four-mile transmission line project in a highly urban area. Tasks included developing and implementing an environmental permit and compliance awareness training program, providing training to all project construction personnel, reporting to federal and state agencies, providing advice on compliance issues and implementation of erosion control and mitigation measures, providing guidance and oversight of construction activities, and performing public outreach and community relations as needed. For the Sections 55 & 58 Rebuild Project, POWER is a subcontractor to Coutts Brothers, who is the prime contractor (construction) for this work.

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**Eversource Energy, Seacoast Reliability Project, New Hampshire**

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Siting Coordinator/Routing Analyst for a 13-mile 115 kV line rebuild which aims to provide additional transmission capacity to the New Hampshire Seacoast area. Portions of this challenging project follow an active rail system, cross under both a state university and a large tidal bay, and run adjacent to an Air Force Base. advised the client on siting considerations, managed and supervised GIS data acquisition and database development, worked with transmission line engineers to identify line design and ROW requirements, performed opportunities and constraints analysis on a number of potential transmission line route options, identified preferred and alternative route options, prepared written pre-filed testimony, and prepared sections of the project certification application to the New Hampshire Site

Evaluation Committee. POWER is providing project siting efforts along with all detailed engineering for overhead, underground, and submarine transmission.

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#### **National Grid, Section 125 115 kV Transmission Line Project, Massachusetts**

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Environmental Project Manager/Lead Scientist responsible for designing, coordinating, and managing a routing alternatives study and environmental surveys, and coordinating and managing the permitting of a 25-mile project in Massachusetts. Performed and managed vernal pool assessments and wetland delineation and mapping. Prepared federal, state, and local permit applications, performed agency consultation, worked with the internal public outreach and communications team, helped prepare for and attend public information meetings, prepared pre-filed testimony for DPU/Energy Facility Siting Board hearings, worked closely with local Conservation Commissions, provided training and environmental permit compliance oversight during construction.

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#### **TransCanada, Kibby Wind Power Project, Maine**

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Lead Scientist and Project Manager responsible for assisting with the environmental siting and permitting of a 132 MW wind farm, and the associated substation and 27-mile 115 kV transmission line. Specific tasks included agency consultation and environmental study design, public outreach support and community relations, siting and routing assessment, coordinating, performing, and managing environmental surveys including wetland and stream delineations, avian migration and tower collision assessments, large mammal movement assessments, and state- and federally-listed rare, threatened, and endangered species surveys. Also prepared sections of the state and federal permit applications and environmental survey results reports. All permits were successfully obtained, and the project was constructed and became fully operational in 2010.

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#### **Bangor Hydro Electric Company, Northeast Reliability Interconnect, Maine and Canada**

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Senior Scientist who performed field studies and assisted in the preparation of state and federal permit applications for a new approximately 80-mile 345 kV transmission line corridor. This line extended into Canada and therefore automatically triggered the need for an EIS and Presidential Permit. All permits were successfully obtained and the project was constructed.

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#### **Portland Natural Gas Transmission System, New England & Canada**

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Environmental Project Manager responsible for designing, coordinating, and managing extensive environmental studies for a 200-mile natural gas transmission pipeline extending through four New England states and into Canada. Participated and helped manage a rigorous routing analysis which involved extensive consultation with state and federal agencies and local governments and citizens. Also conducted FERC and Clean Water Act permitting and prepared environmental reports (ERs). Participated in all facets of obtaining state and federal permits, including the successful acquisition of a Presidential Permit. Performed extensive natural resource mapping and assessment and permitting work in Massachusetts to obtain

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federal (Section 404) and wetland impact permits under the Massachusetts Wetlands Protection Act. Attended numerous municipal meetings and worked closely with local Conservation Commissions in communities affected by the project.

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**Stonyfield Farm, Transmission Line Routing, Londonderry, New Hampshire**

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Lead Environmental Planner and Wetland Scientist responsible for managing a transmission line routing study for connecting a natural gas-powered electric generation plant to the Public Service of New Hampshire transmission grid. The routing study involved assessing a number of potential route options in a relatively densely populated area. Once a preferred route was identified and approved, Mr. Emond successfully oversaw the wetland mapping and permitting efforts. In addition, Mr. Emond managed the environmental construction compliance effort.

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**Central Maine Power Company, Various Projects, Maine**

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Project Manager and Routing Option Specialist for a number of transmission line projects involving over 300 miles of electric transmission corridor and numerous substations. Built experienced project teams, performed thorough routing analyses to identify routing and siting constraints and opportunities, designed and managed environmental studies including visual impact assessments and mitigation, consulted with state and federal agencies, performed community outreach, prepared permit applications and supporting documents and managed permitting efforts, and manage scopes, scope changes and budgets, and provided expert testimony.

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**New York Power Authority, Niagara Power Project, New York**

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Senior Scientist and Project Manager who participated in the successful relicensing of the Niagara Power Project (NPP), the largest publicly-owned hydroelectric project in the eastern U.S. A major component of the NPP relicensing involved ecological assessments, fisheries entrainment research and analysis, water fluctuation analysis, and sediment sampling within the Lewiston Reservoir, the 1,500-acre pumped-storage reservoir associated with the NPP.

Overall, Mr. Emond's responsibilities included scoping and performing environmental field studies; reviewing and assessing the project's effects on aquatic and terrestrial habitat and species; working collaboratively with state and federal agencies, non-governmental organizations, and other stakeholders; preparing environmental reports; participating in the negotiation process; and preparing and reviewing major sections of the federal applicant-prepared environmental assessment (EA) document.

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**Central Maine Power Company, Harris Station Relicensing, Maine**

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Project Manager who participated in the successful relicensing of Harris Station, a peaking hydroelectric project. Mr. Emond's responsibilities included assessing the project's effects on aquatic and terrestrial habitat and species; working collaboratively with state and federal agencies, non-governmental organizations, and other stakeholders; preparing environmental



reports; participating in the negotiation process; and preparing and reviewing major sections of the FERC relicensing application.

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**Maine Natural Gas, BNAS Transmission Lateral, Maine**

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Environmental Project Manager responsible for designing, coordinating, and managing environmental studies for a 12- inch, 25-mile natural gas transmission pipeline being proposed in order to provide natural gas to the former Brunswick Naval Air Station in Brunswick, Maine. Managed a rigorous routing analysis which involved extensive consultation with state and federal agencies and local governments and citizens. Performed extensive natural resource mapping and assessment and permitting work to obtain federal (Section 404) and wetland impact permits under the Maine Natural Resources Protection Act. Attended numerous meetings and worked closely with local officials in communities affected by the project. All permits were successfully obtained, and the project was construction with no environmental violations.



**1-7: Position Paper on the Presence of Significant Vernal Pools in or Adjacent to Transmission Line Corridors, TRC Engineers, LLC, March 2009.**

**Position Paper on the Presence of Significant Vernal Pools in  
or Adjacent to Transmission Line Corridors in Maine**

**Prepared by:**

**TRC Engineers, LLC**

**Prepared for:**

**Central Maine Power Company**

**March 2009**

## Executive Summary

Central Maine Power Company (CMP), in support of its proposed Maine Power Reliability Program (MPRP), conducted extensive vernal pool mapping and assessment surveys along approximately 620 miles of CMP transmission corridor during the springs of 2007 and 2008. These surveys were performed in accordance with an agency-approved protocol and were consistent with the requirements and timeframes presented in the State of Maine Natural Resources Protection Act (NRPA) Chapter 335 – Significant Wildlife Habitat Rules. Central Maine Power documented 200 natural vernal pools and 689 anthropogenic pools within or adjacent to proposed MPRP transmission corridors. *Rana sylvatica*, *Ambystoma maculatum*, *Ambystoma laterale*, and *Eubrachyopus sp.* or egg masses of these species were observed in these pools. Of the natural vernal pools, 88 (45 percent) qualified as significant vernal pools under Chapter 335. All of these significant vernal pools were located within, or adjacent to, transmission corridors that have been maintained in an early-successional shrub habitat for 40 years or more. In addition, 48 (56 percent) of these significant vernal pools' critical terrestrial habitat was 51 to 75 percent non-forested. In sum, fully 87.5 percent of the identified significant vernal pools had less than 75 percent forested habitat within their critical terrestrial habitat. Most of the non-forested land use within 250 feet of significant vernal pools was transmission corridor. Habitat conditions permeable to amphibian migration, including the presence of leaf litter, coarse woody debris, mammal burrows, dense herbaceous and shrub vegetation cover, were all observed in transmission corridors.

Based on the results of CMP's investigation, no measurable loss of vernal pool functions is apparent in and along electric utility transmission corridors; in fact, significant vernal pools remain abundant and highly productive in the typical scrub/shrub habitat found in most transmission line corridors, even after multiple decades. Data suggest the very different impacts from "hard" land uses (e.g., paved/commercial development) and "soft" land uses (e.g., transmission line maintenance). Given these results, design, location, and construction strategies should focus on maintaining existing vernal pool functions within transmission line corridors. In-lieu fee or preservation type compensatory mitigation strategies are more appropriate where significant natural resource impacts (i.e., functional loss) occurs, and are thus not appropriate in these situations. As an alternative to compensatory mitigation, research to further evaluate best management practices for vernal pool conservation along transmission corridors, may be appropriate.

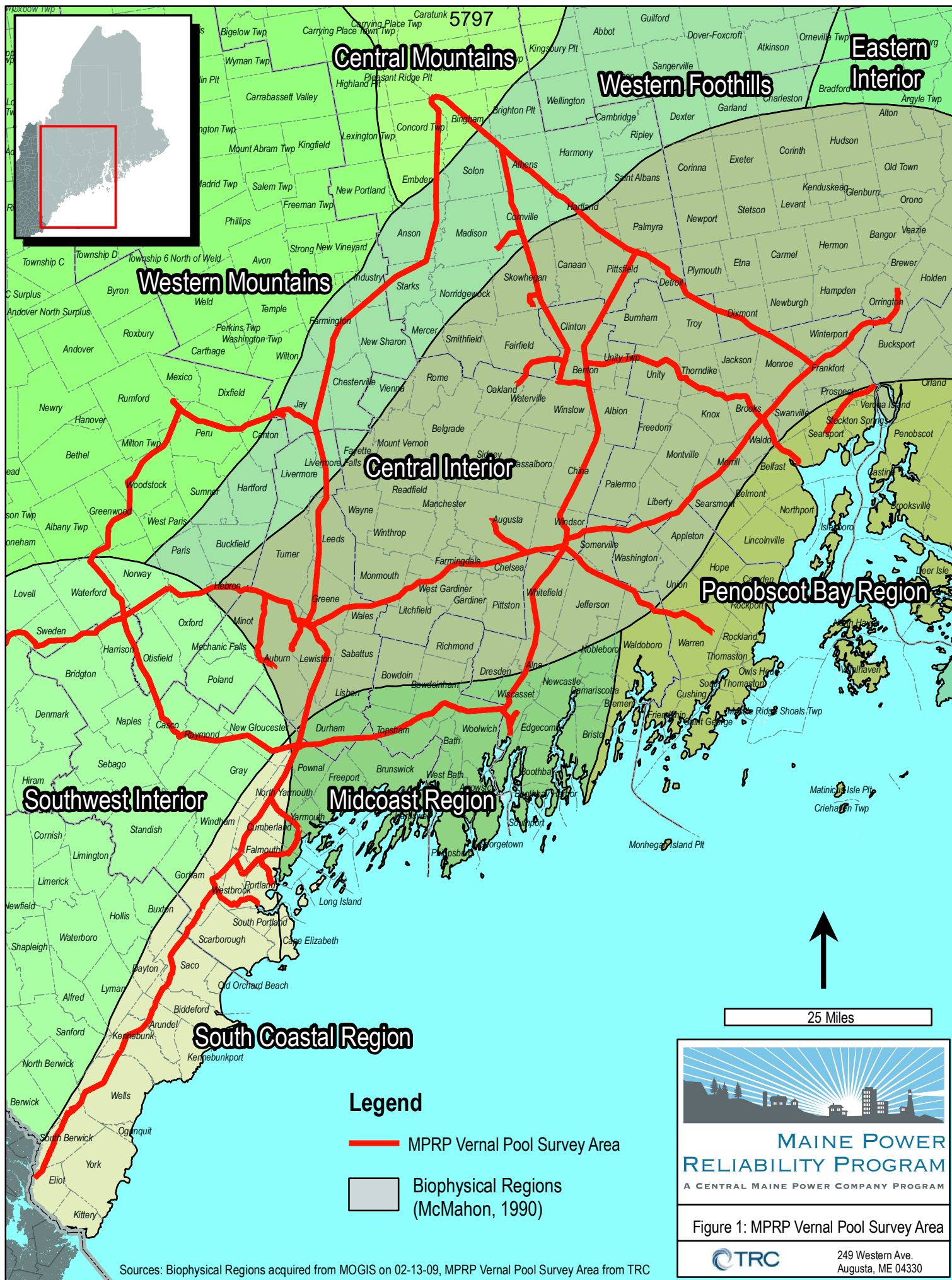


## 1.0 INTRODUCTION

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Central Maine Power Company (CMP) is currently proposing to bolster the long-term reliability of its bulk power electrical transmission system through a project known as the Maine Power Reliability Program (MPRP). As part of this process, CMP is proposing a number of transmission line and substation improvements to add reliability and redundancy to its aging 345 kilovolt (kV) and 115 kV transmission system. A component of this overall proposal is the consideration of potential impacts to various natural resources, including significant vernal pools. In order to document and evaluate the potential effects of the MPRP on significant vernal pools, CMP initiated an unprecedented effort in Maine during the springs of 2007 and 2008 to assess and map vernal pool resources within, and in the vicinity of, a number of existing transmission line corridors and substation sites. TRC Engineering (TRC) was hired to manage and perform this vernal pool resource assessment and mapping effort. In total, TRC surveyed over 620 miles of existing CMP transmission corridor and associated substation sites (both newly proposed substations and substation expansions) for the presence of vernal pool resources. CMP's vernal pool investigation resulted in one of the largest vernal pool datasets in the State of Maine. Figure 1 depicts the vernal pool survey area contrasted with the biophysical regions of Maine.

This position paper first identifies issues relevant to vernal pool conservation, regulation, and management along transmission corridors in Maine based on existing regulations and published best management practices. This is followed by a description of CMP's methods of vernal pool investigation, and a discussion of the results of CMP's investigation relative to existing knowledge of vernal pool ecology. In the final section of this paper, the findings of this vernal pool investigation are summarized, and recommendations are made regarding significant vernal pool management and regulation in transmission corridors.



## 2.0 ISSUE IDENTIFICATION

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In the glaciated northeast, vernal pools are temporary to semi-permanent pools that are located in shallow depressions on the landscape, and that lack permanent hydrologic inlets or outlets and populations of predatory fish (Calhoun and deMaynadier, 2008). Vernal pools provide the primary breeding habitat for several amphibian species (DeGraff and Yamasaki, 2001), as well as other obligate vernal pool species. *Rana sylvatica* (wood frogs), *Ambystoma maculatum* (spotted salamanders), and *Ambystoma laterale* (blue spotted salamanders) spend most of their life cycles in upland or wetland habitats surrounding vernal pools, and migrate to vernal pools for a short part of the year during the spring breeding season (Semlitsch, 2000). Thus, although vernal pools are often small hydrologically isolated wetlands, they share a significant ecological connection to the surrounding landscape.

Regulatory protection is provided to certain vernal pools in Maine by the U.S. Army Corps of Engineers (USACE) under § 404 of the Clean Water Act (33 U.S.C. § 1344) and by the Maine Department of Environmental Protection (MDEP) under the Natural Resources Protection Act. Some municipalities in Maine also regulate impacts to vernal pools in their evaluation of proposed developments (e.g., Town of Falmouth, 2009). In recognition of the ecological connection between vernal pools and the adjacent landscape, federal and state regulations also exert jurisdiction over uplands and wetlands adjacent to vernal pools. Given that vernal pools occur broadly across the landscape in the glaciated northeast (Rheindhardt and Hollands, 2008), vernal pool regulations have significant implications for linear transmission corridor construction, because vernal pools are almost certain to be crossed by transmission corridors which span long distances across the landscape.

Projects reviewed by the USACE, pursuant to the Department of the Army Programmatic General Permit - State of Maine (MEPGP) are evaluated for project impacts within 500 feet of jurisdictional vernal pools. Larger projects being permitted by the USACE may also require review by the U.S. Fish and Wildlife Service (USFWS), which evaluates project impacts within 750 feet of vernal pools. Under NRPA, the MDEP exerts jurisdiction over “significant vernal pool habitat” as one type of regulated “significant wildlife habitat,” which includes significant vernal pools and land within 250 feet of significant vernal pool depressions. Vernal pools qualify as “significant” based on the presence of certain species known to utilize vernal pools for a critical part of their life phase, or by the abundance of egg masses deposited by certain amphibian species (06 096 C.M.R. Ch. 335 § 9(B)). The MDEP does not have jurisdiction over “non-significant” vernal pools. Both federal and state regulations require that applicants attempt to avoid and minimize impacts to these habitats to the greatest extent practicable, and, in some cases, to provide compensation.

Although not a regulatory requirement, some researchers/authors of current best development practices (guidance for avoiding and minimizing effects) for vernal pool

management recommend no impact to the vernal pool depression and minimal disturbance to the habitat within 100 feet of the pool, and maintenance of 75% of the habitat from 100 to 750 feet of the pool as contiguous forest with undisturbed ground cover (Calhoun and Klemens, 2002). These guidelines identify the habitat from 100 to 750 feet of the pool as the “critical terrestrial habitat” for pool breeding amphibians. Chapter 335 of MDEP’s rules defines significant vernal pool habitat as a significant vernal pool depression and that portion of the critical terrestrial habitat within 250 feet of the high water mark of the pool depression.

Due to a lack of published research evaluating vernal pool conservation strategies, the vernal pool best development practices were developed based primarily on years of field observations regarding the effect of land development on pool breeding wildlife populations, (Calhoun and Klemens, 2002). Two recent case studies have demonstrated that residential and commercial development around vernal pools can cause precipitous declines or collapse of vernal pool breeding amphibians (Windmiller et al., 2008). The existing best development practices were based on the limited research regarding vernal pool conservation strategies that was available at the time of their publication, and they should be considered as provisional best-attempts that may need to be modified to meet local or site specific conservation needs (Windmiller and Calhoun, 2008). Despite the provisional nature of these guidelines, the current regulatory standards in the NRPA are predicated on the Calhoun and Klemens (2002) best development practices, and utilize a universal (i.e., “one size fits all”) approach to vernal pool conservation, which may not be appropriate to all classes of land use, or optimal for vernal pool conservation and management.

It is also essential to recognize that the existing best development guidelines regarding conservation strategies for vernal pools are specific to three principal land use classes: residential, commercial, and forest management. The Calhoun and Klemens (2002) best development practice recommendations were designed specifically with respect to “hard” land uses (i.e., clearing, grubbing, grading and paving), including commercial and residential development that result in effectively irreversible and permanent habitat loss. More recent case studies evaluating the effect of land use on vernal pool populations also focus on residential and commercial development (Windmiller et al., 2008). However, “soft” land uses, such as forestry operations or transmission corridor construction, where alteration of habitat via removal of large trees (but not necessarily loss of all vegetation or habitat) occurs, warrants a different set of management guidelines. For example, habitat management guidelines for forestry operations have already been developed, and recommend leaving an undisturbed protection zone immediately adjacent to vernal pools, selected harvesting in a larger radius around vernal pools to maintain some shade and canopy cover, and maintaining uncompacted leaf litter and coarse woody debris on the forest floor (Calhoun and deMaynadier, 2004; deMaynadier and Houlahan, 2008). As with the best development guidelines for residential and commercial development, these habitat management guidelines for forestry operations are preliminary and further research is needed to confirm their effectiveness (deMaynadier and Houlahan, 2008). Very little research or published information exists on the effect of transmission corridor construction and maintenance on vernal pools in the glaciated northeast, and no best

development guidelines for transmission corridors relative to vernal pools have been published.

The lack of data regarding whether transmission corridor construction and maintenance adversely affects vernal pool populations is important to recognize, because the effect of transmission corridors on significant vernal pool habitats is markedly different than that of residential and commercial development, or even forestry operations. Transmission corridor construction through forested areas affects habitat principally via the conversion of forest to shrub and herbaceous cover types, and the presence of utility structures that have a minimal footprint. Paved surfaces, permanent roads, lawns, and buildings characteristic of hard forms of development are not necessary for transmission corridor construction and maintenance. Thus, the habitat and landscape conditions that are required to support significant vernal pools (such as shade, woody debris/organic litter, moisture, suitable non-breeding season habitat, and amphibian migration routes) are all maintained along transmission corridors.

Applying Maine's existing NRPA significant vernal pool regulatory and compensatory mitigation framework to transmission corridor construction does not appear to be justified based on the current and evolving knowledge of the effects of transmission line corridors on vernal pools and vernal pool conservation strategies. There is currently no published data documenting that transmission corridors cause a loss or degradation of vernal pool ecological functions.

As will be discussed below, recent scientific observations during CMP's 2007-08 vernal pool investigations indicate that many of the vernal pools occurring in or adjacent to transmission corridors were documented as significant vernal pools as described in Chapter 335. In the absence of previously published data on the occurrence of vernal pools in managed electric transmission corridors, these recent CMP data are particularly useful in evaluating the impact of long-established transmission line corridors on vernal pools.



### 3.0 METHOD OF INVESTIGATION

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TRC completed vernal pool surveys along existing transmission corridors associated with the MPRP. Many of these corridors have been managed as electric transmission corridors for over 40 years. These surveys were located in the South Coastal, Midcoast, Penobscot Bay, Central Interior, Western Foothill, and Western Mountain biophysical regions of Maine (see Figure 1). The objectives of the vernal pool surveys were to identify potential vernal pools within the program area; to determine if the identified pools were being used by obligate pool species; to determine if any of the pools met the criteria for designation as significant vernal pool habitat in accordance with NRPA standards; and to determine U.S. Army Corps jurisdiction under Section 404 of the Clean Water Act.

Under NRPA regulatory standards (06 096 C.M.R. Ch. 335 § 9(B)) significant vernal pools are defined by either: (1) the abundance criteria, which requires surveying the number of amphibian egg masses belonging to certain species and the presence of fairy shrimp in any life stage; or (2) the rarity criteria, which looks to the documented use of a vernal pool by one or more state-listed threatened (T) or endangered (E) species that commonly require a vernal pool to complete a critical life stage. The specific egg mass abundance criteria that are necessary for a vernal pool to be considered significant include:

| <u>Species</u>           | <u>Abundance Criteria</u>                      |
|--------------------------|------------------------------------------------|
| Blue spotted salamanders | Presence of 10 or more egg masses <sup>1</sup> |
| Spotted salamanders      | Presence of 20 or more egg masses              |
| Wood frogs               | Presence of 40 or more egg masses              |

In Maine, state-listed threatened or endangered species known to use vernal pools for at least one critical life stage include the following:

| <u>Species</u>                | <u>Listing</u>  | <u>Life Stage(s)</u>                             |
|-------------------------------|-----------------|--------------------------------------------------|
| Ringed Boghaunter (dragonfly) | Endangered      | Egg laying, Larval Development, Larval Emergence |
| Spotted Turtle                | Threatened      | Foraging, Courtship, Mating                      |
| Blanding's Turtle             | Endangered      | Foraging, Hibernation                            |
| Ribbon Snake                  | Special Concern | Foraging                                         |
| Wood Turtle                   | Special Concern | Foraging                                         |

Thus, field investigations focused on identification and tally of amphibian egg masses, identification of fairy shrimp, identification of threatened and endangered species, and wood frog chorusing surveys. Vernal pool and adjacent habitat characteristics were recorded. Evidence of anthropogenic alteration to the identified vernal pools was also

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<sup>1</sup> An egg mass is defined as three or more individual eggs clumped in a gelatinous matrix (06 096 C.M.R. Ch. 335 § 9(B)(4).)

documented. Pools that were created by anthropogenic activities, such as flooded ATV ruts surrounded by soils that were not flooded, were noted as “amphibian breeding areas” in order to distinguish them from non-significant natural vernal pools and significant natural vernal pools.

The timing of vernal pool surveys was also an important consideration. Vernal pool surveys were timed to coincide with the portion of the year when they are used by amphibians and invertebrates for breeding or aquatic phases of their lifecycle. Southern and coastal areas were surveyed first, followed by the western and northern portions of the study area. Egg mass surveys were conducted within the following regional timeframes suggested by the MDEP:

| <u>Geographic Region</u> <sup>2</sup> | <u>Wood Frogs</u>  | <u>Spotted and Blue Spotted Salamanders</u> |
|---------------------------------------|--------------------|---------------------------------------------|
| Northern Maine                        | May 1 – May 21     | May 10 – May 31                             |
| Southern Maine                        | April 7 – April 21 | April 20 – May 21                           |

Field surveys were conducted by teams of two biologists experienced with evaluation of vernal pools of New England. Each team was responsible for documenting observations on a vernal pool data form that had previously been approved by Maine regulatory agencies. The field teams walked along study corridors to identify and assess new vernal pools, as well as to evaluate any potential vernal pools that had been previously identified from existing information. In general, each field team “meandered” within the study corridor to thoroughly assess the corridor and minimize the chances of any vernal pools (both in and outside of the study corridor) being missed.

To be consistent with NRPA protocol requirements and recommendations, amphibian egg mass surveys were conducted under appropriate field conditions and within the recommended daily timeframes for such survey efforts. To the extent possible, egg mass surveys were conducted during the day when the sun was out (typically between 9 am - 4 pm). Polarized sunglasses were generally used to minimize sun glare and to aid in the detection of egg masses. Two biologists conducted surveys beginning from separate ends of each pool and thoroughly searched the entire pool together, including the pool center, to ensure that all egg masses were counted. In order to reduce the possibility of errors or omissions in field observations, field biologist teams collaborated to observe, identify, and count egg masses. When agreement was reached regarding the number and types of egg masses that were present within an individual pool, the field team documented findings on the data form and took photographs. In order to prevent disturbance of breeding amphibians and egg masses, biologists entered and stayed within the pools only long enough to collect the necessary data for vernal pool evaluation, and were careful not to dislodge egg masses from attachment sites.

Wood frog chorusing surveys and fairy shrimp surveys were also completed concurrently with amphibian egg mass surveys. Chorusing wood frogs were noted and used to

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<sup>2</sup> The northern Maine region is considered to be that part of the state north of a line extending from Fryeburg to Auburn to Skowhegan to Calais. The southern Maine region is the part of the state south of that same line (06 096 C.M.R. Ch. 335 § 9(B)(4)).

evaluate whether additional breeding activity could be anticipated within nearby pools and, hence, whether the pools should be revisited at a later date when breeding activity was completed for the season. Fairy shrimp were identified using dip nets, and direct visual observation of fairy shrimp within the water column. View tubes were also occasionally used. Biologists carefully searched sunny patches in the pool, as fairy shrimp often congregate in these areas.

A Geographic Information System (GIS) analysis of land use within the 250 foot critical terrestrial habitat of identified significant vernal pools was completed subsequent to field surveys. Based on aerial photo interpretation and the transmission right-of-way (ROW) boundary, land use was classified into forested and non-forested cover types occurring within and outside of the ROW boundary. Non-forested cover types included scrub-shrub transmission corridor, hayfields, croplands, and developed areas such as roads, houses, and lawns.

## 4.0 RESULTS AND DISCUSSION

Vernal pools were found to be abundant within and immediately adjacent to CMP's transmission corridors. CMP identified 88 significant vernal pools, 112 non-significant natural vernal pools, and 689 anthropogenically altered or created amphibian breeding areas (Table 1). Thus, of the vernal pools that were identified, 44 percent met the NRPA criteria for significant vernal pools. According to the Maine Department of Inland Fisheries and Wildlife (MDIF&W statement at a Maine Association of Wetland Scientists vernal pool workshop on February 6, 2009), that agency maintains a database of 230 natural vernal pools of which 63 (27 percent) are significant vernal pools. At a February 2009 professional workshop addressing vernal pool protection and management in Maine, agency officials stated that approximately 40 to 50 percent of the natural vernal pools on the landscape were expected to meet the Chapter 335 Significant Wildlife Habitat Rules vernal pool significance criteria. The occurrence of significant natural vernal pools along the transmission corridors surveyed as part of the MPRP (44 percent) falls in the middle of that 40 to 50 range and compares well with regulatory expectations. In addition, the occurrence ratio of significant vernal pools to all natural vernal pools within and along CMP's transmission corridors ( $88/200 = 44$  percent) is higher than that of the existing MDIF&W vernal pool database ( $63/230 = 27$  percent)

Spotted salamanders, blue spotted salamanders, and wood frogs were among the identified amphibians or amphibian egg masses. Fairy shrimp were also identified in a very limited number of pools. Other than the occurrence of fairy shrimp, no threatened or endangered species were observed within 250 feet of any vernal pools. This dataset is one of the largest vernal pool databases within the State of Maine.

The 689 identified amphibian breeding areas were comprised of pools created by human activities, but that were used by obligate pool breeding amphibians. Amphibian breeding areas were primarily all terrain vehicle (ATV) ruts located in wetlands or uplands, but other types of amphibian breeding areas such as farm ponds were also documented. Vernal pools created by human activities can often serve as ecological traps with insufficient hydroperiods, but some anthropogenic pools may have adequate hydroperiods for breeding success (DiMauro and Hunter, 2002). The ecological function of anthropogenically created amphibian breeding areas along transmission corridors is probably variable, and at this time their suitability as viable vernal pool habitat is unproven.

**Table 1 Summary of Vernal Pools Identified Along the MPRP Survey Corridor**

| Approximate Survey<br>Mileage | Significant Natural<br>Vernal Pools | Non-Significant<br>Natural Vernal Pools | Anthropogenically<br>Altered/Created<br>Amphibian Breeding<br>Areas |
|-------------------------------|-------------------------------------|-----------------------------------------|---------------------------------------------------------------------|
| 620                           | 88                                  | 112                                     | 689                                                                 |

Among the 88 pools that qualify as significant vernal pools under NRPA standards, 77 have non-forested cover types exceeding 25 percent of their critical terrestrial habitat (within 250 feet of the pool) (Table 2). The average non-forested coverage within 250 feet of significant vernal pools was 44 percent, with a range of 14 to 86 percent non-forested coverage (Table 3). Of these significant vernal pools, 50 currently have 26 to 50 percent non-forested cover types within 250 feet of the pool (Table 2), and 26 have 51 to 75 percent non-forested cover types. Land use within 250 feet of significant vernal pools included utility corridor, forest, agricultural land, and “hard” land uses such as roads, parking lots, houses/subdivisions, and lawns. Existing transmission corridors accounted for the vast majority of non-forested cover types within 250 feet of significant vernal pools. Of note, 87.5 percent of significant vernal pools within the surveyed corridors contained less than 25 percent forested cover types within their critical terrestrial habitat (within 250 feet of the pool depression).

The transmission corridors that the pools are located within or along have been in existence and managed as non-forested, early-successional habitat for nearly half a century or more (Table 2). These data suggest that conversion of forest cover types to utility corridor can support and maintain viable and healthy populations of vernal pool breeding amphibians, even after time periods spanning multiple amphibian generations. However, despite what appears to be robust populations of pool breeding amphibians and abundant pool breeding habitat along transmission corridors in Maine, NRPA standards suggest that existing transmission corridors that have existed for multiple decades may need to be counted toward the 25% non-forested habitat threshold beyond which mitigation is required.

**Table 2: Significant Vernal Pool Buffer Habitat Characteristics  
Along the Survey Corridor**

| Total Number of<br>Significant Vernal<br>Pools | Approximate Age Range<br>of Existing Utility<br>Corridor (years) | Existing Non-Forested Habitat Cover Within 250<br>Feet of Significant Vernal Pools |      |        |      |        |      |               |   |
|------------------------------------------------|------------------------------------------------------------------|------------------------------------------------------------------------------------|------|--------|------|--------|------|---------------|---|
|                                                |                                                                  | < 25%                                                                              |      | 26-50% |      | 51-75% |      | 76% -<br>100% |   |
|                                                |                                                                  | n                                                                                  | %    | n      | %    | n      | %    | n             | % |
| 88                                             | 40 to 60 plus                                                    | 11                                                                                 | 12.5 | 50     | 56.8 | 26     | 29.5 | 1             | 1 |

The documented abundance of significant vernal pools and associated wildlife occurrences within the surveyed CMP corridors suggests that the habitat conditions necessary to supporting vernal pool populations are maintained along transmission corridors. This is despite the removal of trees that are required to construct and maintain transmission line corridors in a safe and reliable condition. Among these habitat conditions are sufficient pool hydroperiods (Skidds and Golet, 2005), organic carbon inputs to vernal pool depressions via leaf litter and herbaceous vegetation, landscapes that are permeable to amphibian migration (Calhoun and Klemens, 2002), and suitable non-breeding season habitat (Semlitsch, 2000).

**Table 3: Non-Forested Habitat Cover Within 250 Feet of Significant Vernal Pools**

| Number of Pools | Mean | Range      |
|-----------------|------|------------|
| 88              | 44%  | 14% to 86% |



Hydroperiod, an essential element of amphibian breeding success, requires that suitable breeding habitat containing vernal pools must hold water long enough for amphibian larvae to complete their aquatic life phase (Skidds and Golet, 2005). Soil disturbance, harvest road construction, and tree removal are three activities that have been noted as having the potential to affect pool hydroperiod in managed forests (deMaynadier and Houlahan, 2008). While tree removal activities occur during transmission corridor construction, there are significant differences in their implementation relative to forestry operations. The primary differences and similarities between transmission line corridor establishment and forestry operations are summarized below.

During transmission corridor construction, soil disturbance is minimized by the use of erosion and sediment control measures, routine environmental inspections by utility representatives and consultants, third party environmental inspections, and the use of construction mats in wet areas to prevent soil rutting and compaction. Conversely, these practices are generally neither followed nor required in forest management operations. Permanent harvest roads that can alter local surface drainage patterns are common on managed woodlands. Permanent harvest roads are not constructed within transmission corridors. In addition, on transmission corridor projects, initial tree removal is completed in a relatively rapid, one-time effort. In contrast, soils in managed woodlands are often disturbed by the repeated passage of heavy equipment over time, during one or more forest harvests.

Furthermore, forest harvesting has not been proven to produce long-term effects on seasonal forest pool hydroperiod based on chronosequence investigations (Batzner et al., 2000; Palik et al., 2001). Higher groundwater tables have been documented following harvesting (Sun et al., 2000), suggesting that tree removal will not shorten pool hydroperiod. Other work has revealed only subtle effects on local water tables outside of the immediate post-harvest time period (Bliss and Comerford, 2002). These findings suggest that tree removal related to transmission corridor construction will not have any significant long-term effect on vernal pool hydroperiods.

That vernal pools and evidence of pool breeding wildlife populations were common along existing transmission corridors during 2007 and 2008 vernal pool assessment surveys demonstrates that the hydroperiod of many transmission corridor vernal pools is sufficient for pool breeding amphibians to complete their aquatic life phase. In the glaciated northeast, factors such as surficial geologic setting, landscape position, geomorphic setting, and catchment size may very well be more relevant to vernal pool hydroperiod within transmission corridors than tree removal and other activities related to transmission corridor construction.

Importation of leaves, woody debris, and other organic matter to vernal pool basins by wind, flowing water, or other means provides a source of organic carbon to vernal pool habitats. Such carbon sources may be important to supporting a pool's food web (Battle and Golladay, 2001). These organic matter inputs are derived from vegetation that grows within vernal pools and/or in adjacent uplands and wetlands. Transmission corridors are

maintained to support a completely vegetated shrub cover type. Common plants that were observed within Maine transmission corridor uplands during field surveys include *Juniperus communalis* (common juniper), *Spirea latifolia* (meadowsweet), *Rhus typhina* (staghorn sumac), graminoids, several herbaceous species, and hardwood saplings. In wetlands and vernal pools within transmission corridors *Ilex verticillata* (winterberry), *Alnus rugosa* (speckled alder), *Spirea tomentosa* (steeplesbush), meadowsweet, *Onoclea sensibilis* (sensitive fern), *Osmunda cinnamomea* (cinnamon fern), and *Scirpus cyperinus* (wool grass) were commonly observed during field surveys. Most vernal pools along the transmission corridor contained significant amounts of organic detritus, which was apparently derived from vegetation within and/or adjacent to the transmission corridor. In addition to providing a source of organic carbon to support secondary production within vernal pools, these plants or their fallen woody branches parts were utilized as amphibian egg mass attachment sites. Subsequent to leaf out, shrub species provide a source of pool shade, as do taller trees adjacent to transmission line corridors.

In order to complete their life cycles and sustain local populations, pool breeding amphibians must be able to successfully migrate across the landscape to suitable non-breeding season habitat (Semlitsch and Skelly, 2008). According to literature, forested settings are the natural and preferred habitat for ambystomatid salamanders and wood frogs (DeGraff and Yamasaki, 2001); however, pool breeding amphibians are known to travel across other non-forested cover types. For example, in one Rhode Island study of golf course fairways, non-forested areas were not a dispersal barrier to spotted salamanders travelling to adjacent forested areas (Montieth and Paton, 2006). The presence of uncompacted leaf litter, coarse woody debris, and shade are important habitat characteristics for pool breeding amphibians (deMaynadier and Hunter, 1995). Areas with high densities of small mammal burrows and cool microclimates have also been found to be preferred by spotted salamanders (Montieth and Paton, 2006).

During field surveys, leaf litter, coarse woody debris, and mammal burrows were all observed within the early-successional cover type of Maine electricity transmission corridors. Shrubs observed in transmission corridors provide shade and organic debris. In addition, many vernal pools within Maine's transmission corridors were found within larger wetland complexes dominated by the scrub-shrub and emergent vegetation cover types. Many of these wetlands spanned the entire transmission corridor, thereby providing a moist environment for amphibians to migrate through as they travel between their breeding pool and adjacent habitat. This demonstrates that transmission corridors are 'permeable' to amphibian migration and movement. This is in contrast to many forms of hard land uses where pavement and construction destroys, removes, or permanently covers burrows, leaf litter, and woody debris, and also introduces the threat of vehicular mortality.

Suitable non-breeding season habitat is also essential for maintaining populations of amphibians that breed in vernal pools. Mean travel distances for spotted salamanders and wood frogs have been calculated at 390 feet and 633 feet, respectively, while maximum travel distances were measured to be 817 feet and 1,549 feet, respectively (numerous studies in Semlitsch and Skelly, 2008).

Transmission corridors surveyed for the MPRP were usually less than a few hundred feet wide; many were less than 150 feet and were adjacent to forested habitat. Therefore, non-breeding season forested habitats adjacent to transmission corridors are well within documented migration distances for pool breeding amphibians. In addition, in Pennsylvania transmission corridors maintained in an early-successional habitat condition were found to provide sufficiently moist microenvironments for salamanders including *Ambystoma jeffersonianum* (Jefferson salamander), *Plethodon cinereus* (red back salamander), and spotted salamander (Yahner et al., 2001). Therefore, it is also plausible that in Maine, the transmission corridor itself may be used as habitat, provided that sufficient leaf litter, burrows, and coarse woody debris, moisture, and shade are present.

## 5.0 SUMMARY AND RECOMMENDATIONS

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In the glaciated northeast, vernal pools have become a focal issue in conservation and land use planning. Regulation of certain vernal pools in Maine has significant implications on the design and permitting of electric transmission corridors and vernal pool management. While existing recommended best development practices for vernal pool conservation are provisional, and were developed to address typically “hard” residential and commercial development, NRPA vernal pool regulations appear to have been developed around these preliminary guidelines and are being applied to a much broader class of land uses (e.g., “soft” land uses including electric transmission line corridors). The most recent literature, however, emphasizes the need for site-specific planning and flexibility for meeting vernal pool conservation needs. Thus, CMP sought to identify vernal pools in its existing transmission corridors and evaluate the implications of the existing regulatory framework on transmission corridor design, permitting, and maintenance. In completing this effort, CMP compiled what is likely one of the largest vernal pool databases in Maine. This new dataset adds to our understanding of vernal pool resources in Maine.

CMP’s investigation demonstrates that vernal pools are ubiquitous in transmission corridors located within its service territory. Even after many decades of being managed as early-successional habitat, anthropogenic, natural, and significant vernal pools were found to be common in these corridors. The vast majority (87.5%) of the identified significant vernal pools that would be subject to NRPA jurisdiction currently have vernal pool critical terrestrial habitat that is less than 75 percent forested within 250 feet of the pool; in other words, more than 25 percent of the existing non-forested critical terrestrial habitat around these identified significant vernal pools is managed as early-successional habitat. Field observations of vegetation cover, leaf litter, and coarse woody debris suggest that transmission corridors support habitats that are permeable to the migration of vernal pool breeding amphibians to and from adjacent forests, and that transmission corridors themselves may be utilized as non-breeding season amphibian habitat. The observed abundance of natural and significant vernal pools that were utilized as breeding habitat by obligate vernal pool breeding species suggests that vernal pools in and along transmission corridors are able to function without loss or significant degradation of their ecological function.

These findings are significant relative to vernal pool management as it pertains to electric transmission corridor construction and maintenance. Data on significant vernal pools within and/or along CMP corridors, existing literature, and regulatory guidelines and requirements all demonstrate that significant vernal pools and transmission corridors (as currently constructed and maintained) are compatible. This is further emphasized by the following summary points:

- Extensive data collected by CMP show that significant vernal pools occur in transmission line corridors within the expected frequency range, and at a greater rate than shown in MDIF&W’s existing database. Specifically, 45 percent of the

natural vernal pools assessed along CMP transmission corridors were significant. This falls in the middle of the agency-expected range of 40 to 50 percent of all pools assessed being significant;

- The average percentage of non-forested habitat within 250 feet of these significant vernal pools was 44 percent;
- Only 12.5 percent of these significant vernal pools had greater than 75 percent forest habitat coverage with their 250 foot buffers;
- Constructing and maintaining transmission line corridors does not negatively affect vernal pool hydroperiod;
- The early-successional (shrub and herbaceous vegetation) habitat associated with transmission line corridors appears to be permeable to amphibian migration and is capable of sustaining highly productive amphibian breeding habitat;
- The life span of the spotted salamander averages 15 to 20 years. Some of these corridors have been in existence for 40 or more years, a time period which spans multiple generations of spotted salamander. Given that the literature suggests that mole salamanders have high pool spawning fidelity (i.e., over 90 percent of the time they return to spawn in the pools from which they hatched and emerged), the data strongly suggests that several generations of spotted salamanders have successfully reproduced in these vernal pools. In addition, their offspring continue to breed in these pools;
- There is no literature demonstrating adverse impacts from transmission line corridors on vernal pools;
- Current regulations are based on studies that focused on “hard” developments, which are very dissimilar to the vegetated conditions present within transmission line corridors; and
- The current management of vernal pools in transmission line corridors is consistent with some of the significant vernal pool habitat management guidelines and goals presented in Chapter 335 and Calhoun and Klemens (2002). These guidelines and how they are wholly or partially met are as follows:
  - (1) *No disturbance within the vernal pool depression.* CMP and other electric utility companies expend a great amount of effort to ensure that vernal pool depressions are not disturbed during construction and maintenance activities. These efforts include (1) providing environmental oversight during the project design phase to ensure that, whenever possible, pole structures are not placed in vernal pools; (2) implementing and maintaining erosion and sediment controls that help prevent siltation of pools; (3) marking vernal pool depression with flagging tape prior to construction; and (4) performing environmental inspections during



construction to ensure that pools are not traversed by vehicles and construction equipment;

- (2) *Maintain a minimum of 75% of the critical terrestrial habitat as unfragmented forest with at least a partly-closed canopy of overstory trees to provide shade, deep litter and woody debris.* Although transmission line corridors cannot be maintained as forest for reliability and safety reasons (in other words, it is not “practicable”), they are maintained as early-successional habitat composed of shrubs and herbaceous plants. This habitat type provides some level of shading, significant litter accumulation (carbon input) from leaf drop and the die-back of herbaceous vegetation, and woody debris;
- (3) *Maintain or restore forest corridors connecting wetlands and significant vernal pools.* Within transmission line corridors, amphibian travel corridors composed of shrubs and thick growth of herbaceous vegetation are often present. Also, the CMP data indicate that transmission line corridors and their early-successional habitat are permeable to amphibian migration. This meets the needs for maintaining forested travel corridors, which are often required in the vicinity of “hard” development;
- (4) *Minimize forest floor disturbance.* With the exception of pole structure locations, transmission line corridors are not grubbed. Rather, trees are cut at ground level and root systems are left in the ground. In addition, mitigation techniques including winter construction and the use of equipment mats are utilized during construction to minimize ground disturbance such as rutting. By virtue of how transmission line corridors are constructed and maintained, ground disturbance is minimized;
- (5) *Maintain native understory vegetation and downed woody debris.* Transmission line corridors are constructed and maintained to encourage the growth of understory vegetation including shrubs and herbaceous plants. Also, downed woody debris from shrubs occurs naturally and is very common in transmission line corridors.

All of this information indicates that transmission line corridors, as they are currently constructed and maintained in Maine, do not cause a loss of the important ecological functions associated with significant vernal pools in Maine.

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**1-8: Vernal Pool Occurrence and Species Distribution within Electrical Transmission Rights-of-Ways in Maine, TRC Environmental, April 2011.**

## **Vernal Pool Occurrence and Species Distribution within Electrical Transmission Right-of-Ways in Maine**

Colin P. Duncan, PWS, CPSS, TRC Environmental

Alex Finamore, CWS, TRC Environmental

Adam Slayton, TRC Environmental

Kristen Marcoux, TRC Environmental

Due to the nature of long distance bulk energy transmission, transmission corridors (or right-of-ways (ROWs)) occur in virtually every landscape position and habitat type across the country. ROWs are managed to sustain non-forested vegetation and can be several hundred feet in width and up to several hundred miles in length. Accordingly, they traverse regulated areas such as wetlands and vernal pool habitats throughout the glaciated northeast. Vernal pools and adjacent habitat areas are regulated by both state and federal agencies, each of which having unique criteria for determining thresholds of jurisdiction. A key aspect to “classically-defined” northeast vernal pool ecology and their regulatory definition is the presence of forested uplands around the pools that provide non-breeding adult-stage habitat for primary vernal pool species such as Ambystomid salamanders and wood frogs (*Rana sylvatica*). Therefore, the management of ROWs to allow only non-forested vegetation in and around vernal pools in the ROW presents a potential conflict for sustaining essential vernal pool habitat conditions. The major question that arises from this potential management conflict is whether and to what extent vernal pools are affected by ROWs in overall occurrence, types of species supported, and the potential populations of organisms based partially on the density of yearly egg masses. Due to the individual permitting requirements associated with several large and geographically diverse ROW maintenance and expansion projects in Maine, an evaluation of a large number of vernal pools occurring in and near ROWs was undertaken to evaluate vernal pool occurrence and species distribution within ROWs. It is worth noting that a large number of the ROWs surveyed have been maintained as non-forested corridors for 40 years or more.

Vernal pool habitats occurring within two large ROW maintenance and expansion projects in Maine were identified and evaluated over multiple breeding seasons. The methodology for field data collection was established based on regulatory criteria, and was similar between the projects. Field parameters included amphibian egg mass counts with species identification as well as other key characteristics cited in scientific literature and regulatory definitions. Surveys were scheduled to observe potential pools during and immediately following the period of active ovipositioning, and in most cases pools were observed twice during the breeding season to view the occurrence of different species that produce egg masses in earlier and later portions of the season. It was also noted if pools were entirely or partially within, or adjacent to the maintained ROW corridor by “percent within the ROW” along this continuum. For purposes of this analysis, pools that occurred within at least 75% within the ROW were considered to be fully “ROW” pools. Categories of pools that were 25 to 75% in the ROW were considered transitional and the balance of the observed pools were considered non-ROW pools. Portions of the projects



involving proposed, undeveloped ROW corridors and potential mitigation sites afforded the opportunity to conduct the same surveys to observe and compare pools within undeveloped areas.

Results for all the surveys were tallied and analyzed for 1,834 vernal pools, all of which contained either wood frog or spotted salamander egg masses, or both. Vernal pool occurrence observations indicate that 55.3% of the total pools observed were considered ROW pools and 23.5% of the pools were found in a non-ROW setting. The remaining 21.2% of the pools were in transitional areas. A total of 1,175 identified pools contained wood frog egg masses. Among these pools, 66.7% occurred in the ROW, 23.7% occurred in transition areas and 9.5% in non-ROW areas. A total of 1,301 identified pools contained spotted salamanders. Among these pools 49.5% occurred in the ROW, 19.9% occurred in transitional areas, and 30.6% occurred in non-ROW areas.

In order to determine the relative “productivity” of each pool in terms of the number of egg masses that were present at the point of seasonally highest occurrence, the number of egg masses occurring per pool for each species was categorized into groups of 1 to 9, 10 to 19, 20 to 39 and 40 or greater egg masses. In this way, it is easier to see which pools could meet the Maine Department of Environmental Protection (MDEP) definition for a Significant Vernal Pool (SVP) (see below). For wood frogs, pools in the ROW (i.e., as above, with 75% of pool occurring in ROW) containing 1 to 9 egg masses comprised 63.7% of the total pools, and 21% of the pools contained 20 or more egg masses (9.3% with 40 or more egg masses). For pools outside of the ROW, pools containing 1 to 9 wood frog egg masses comprised 92.1% of the total pools, and 4.4% of the pools contained 20 or more egg masses (2.6% with 40 or more egg masses). For spotted salamanders, pools in the ROW containing 1 to 9 egg masses comprised 79.5% of the total pools, and 9.1% of the pools contained 20 or more egg masses (3.1% with 40 or more egg masses). For pools outside of the ROW, pools containing 1 to 9 egg masses comprised 62.2% of the total pools, and 26.2% of the pools contained 20 or more egg masses (10.2% with 40 or more egg masses).

This large sampling of data provides the opportunity for several observations. First, while the vernal pool observations concentrated on ROWs and their immediate environs versus a broader study that would compare undeveloped land to ROW, vernal pools containing spotted salamanders and wood frogs egg masses occur half and two-thirds of the time, respectively, directly within ROWs relative to transitional or non-ROW settings. Second, for wood frogs, pools that occur directly within the ROW have a higher egg mass count and distribution per pool (36.3% with 10 or more egg masses) as compared with pools in non-ROW settings (7.9% with 10 or more egg masses). This trend is somewhat reversed for spotted salamanders, though not as pronounced. This suggests that the increased amount of sunlight in an open ROW area compared to an area of dense forested canopy, encouraged wood frog breeding, whereas the spotted salamander prefers deeper depressions with slightly longer hydroperiods typically receiving less direct sunlight.

When looking at pools potentially regulated by the Maine Department of Environmental Protection (MDEP), pools were broken down similarly, as above, with bins (percentage categories) including pools in ranges of ROW occupancy ranging from 0-25%, 26-50%, 51-75%,

and 76-100%. Pools with a 100% rating were found to be completely in a woodland setting, conversely pools with a 0% rating were found to be completely in the non-forested ROW. Due to the majority of the project area being located within existing ROW areas, the data summaries indicate that 67% of the pools surveyed on this project were located nearly entirely within the ROW. Eight percent of the pools within the ROW (0-25% forested) were found to have over 40 wood frog egg masses and therefore potentially regulated by the MDEP. Comparatively, 12% were found to have the same abundance in non-ROW (76-100% forested) settings. For spotted salamanders, a 20 egg mass threshold was used to coincide with MDEP regulations. In the ROW setting, 6% of the pools met MDEP *abundance* criteria, while in the non-ROW setting 20% met the criteria.

These findings are congruent with the results found above as that wood frogs do not show a strong preference between pools with a forested canopy and pools within a maintained ROW setting and therefore demonstrate that maintained ROW vegetation does not seem to be a deterrent in the usage of pools in these areas for breeding. Spotted Salamanders are shown to have a higher abundance within a forested setting as opposed to a maintained ROW and similarly have more pools with the potential to be regulated by the MDEP. This may be explained, as discussed above, by a preference for deeper pools with a more forested canopy.

Continued studies of vernal pools within ROWs and adjacent habitats, including adult population analyses, will help to provide further information about the ecology and viability of vernal pools within non- and semi-forested environments.

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**MATTHEW D. MANAHAN**

Merrill's Wharf  
254 Commercial Street  
Portland, ME 04101

**P** 207.791.1189  
**F** 207.791.1350  
**C** 207.807.4653  
mmanahan@pierceatwood.com  
pierceatwood.com

Admitted in: MA, ME, NH

May 1, 2019

James R. Beyer  
Maine Dept. of Environmental Protection  
106 Hogan Road, Suite 6  
Bangor, ME 04401

Bill Hinkel  
Land Use Planning Commission  
22 State House Station  
Augusta, ME 04333-0022

RE: NECEC – Pre-Filed Supplemental Testimony

Dear Jim and Bill:

Enclosed is CMP's Pre-Filed Supplemental Testimony in response to DEP's 10<sup>th</sup> Procedural Order. Pursuant to the Third Procedural Orders, we are also mailing hard copies as follows:

- Original and 4 copies of CMP's Pre-Filed Direct Testimony for the DEP;
- Original and 9 copies of CMP's Pre-Filed Direct Testimony for LUPC.

Note that Gerry Mirabile's supplemental testimony includes, as Exhibit CMP-2.2-A, a list of which witnesses address each of the information requests in DEP's 10<sup>th</sup> Procedural Order.

CMP witness Amy Segal has adopted the Supplemental Testimony of CMP witness Terrence DeWan, and Ms. Segal will be present and available for cross-examination and DEP questions on May 9, 2019. However, Ms. Segal is available only until 5:00 p.m. that day. While we do not anticipate her unavailability during the evening to be a problem, given that CMP's witnesses are likely to present their oral summaries and stand for cross-examination and DEP questions prior to the witnesses of other parties, we wanted to alert the Department of her evening availability constraints. Mr. DeWan will be available for the entirety of the May 9 hearing, including that evening.

Thank you.

Sincerely,



Matthew D. Manahan

Enclosure

cc: Service Lists (via email)

STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )  
)  
CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED SUPPLEMENTAL TESTIMONY  
of

CENTRAL MAINE POWER COMPANY

MAY 1, 2019



**EXHIBIT LIST FOR PRE-FILED SUPPLEMENTAL TESTIMONY  
OF CENTRAL MAINE POWER COMPANY**

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STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
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Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED SUPPLEMENTAL TESTIMONY OF  
THORN DICKINSON

May 1, 2019

This testimony is in response to the questions and data requests in the Tenth Procedural Order relating to installation of portions of the NECEC Project transmission line underground.

**I. APPENDIX A TO THE TENTH PROCEDURAL ORDER**

In this supplemental testimony, I will respond to the following Cost/Financial Questions in Appendix A:

**QUESTION 22: ADDITIONAL DESCRIPTION OF ALLOWANCE FOR FUNDS USED DURING CONSTRUCTION (AFDUC), AND WHETHER THERE IS ANY AFUDC INCLUDED IN THE \$950 MILLION ORIGINAL PROJECT COST ESTIMATE.**

Allowance for funds used during construction (AFUDC) is the cost of financing during the construction period of a project, prior to when the project is placed in service. The cost of financing consists of interest on borrowed funds and an equity return on CMP's own funds used during construction. There is no AFUDC included in the \$950 million original project cost estimate.

**QUESTION 24: WHETHER THE ORIGINAL \$950 MILLION COST ESTIMATE INCLUDED INDIRECT COSTS SUCH AS CMP AND AVANGRID PERSONNEL.**

The original \$950 million cost estimate included indirect costs such as CMP and Avangrid personnel.

**II. APPENDIX B TO THE TENTH PROCEDURAL ORDER**

In this supplemental testimony, I will respond to the following request for additional information in Appendix B:

**ITEM 4: FOR ALL THE COST ESTIMATE SUMMARY SHEETS IN THE REBUTTAL TESTIMONY, PLEASE PROVIDE ADDITIONAL BACKUP SPREADSHEETS OR DETAILS FOR HOW EACH OF THE LINE ITEM COSTS WERE DETERMINED.**

What follows are details for how each of the line item costs in Exhibit CMP-1.1-B were determined. The method used in that exhibit mirrors the way CMP developed its original cost estimate and developed its transmission rate. In addition, it mirrors the method used in the evaluation report of the Massachusetts Department of Energy Resources Independent Evaluator

(see Independent Evaluator's Report at Exhibit CMP-1.1-A) to determine total net benefit and the resulting NECEC Project ranking.

#### Incremental Capital Cost

An internal cost build-up was done to calculate the incremental capital cost associated with undergrounding the line. The calculation included the additional costs required for undergrounding as well as a deduction for the costs that were not applicable for the underground scenario. This method ensured that there was no double counting of costs.

#### Incremental Capital Cost (With AFUDC)

The incremental capital cost was then used to calculate the AFUDC amount required to account for the costs of financing during the construction period. The incremental capital cost and the AFUDC amount were then added together to establish the total additional plant in-service associated with undergrounding.

The total additional plant in-service was then used to calculate the incremental investment base. The annual incremental rate base was calculated using plant in-service minus depreciation and deferred taxes. The deferred taxes were calculated using the difference between the 40-year depreciation method used for book purposes and the depreciation calculated using the applicable state and federal modified accelerated cost recovery system (MACRS) rates.

#### Increase in Transmission Rate

The incremental investment base was then used to calculate the increased transmission rate by using the cost of service model. The cost of service model uses the incremental investment base (including AFUDC) to calculate the additional annual revenue requirement associated with undergrounding.

The annual revenue requirement has three components that were applicable to this analysis:

- 1) Investment Return - The investment return allows for a return on the average investment base using 5/12 of the beginning investment base plus 7/12 of the forecasted ending investment base. This calculation is consistent with ISO-NE practice. The average rate base was then multiplied by the pretax weighted average cost of capital on the depreciated investment base less deferred income taxes.
- 2) Property Taxes – The property tax amount was calculated by multiplying the additional plant in-service by the composite property tax rate used by the project.
- 3) Depreciation – The annual book depreciation amount which was calculated using a straight-line depreciation method over the 40-year life of the project.

These three components of the annual revenue requirement were then added together to calculate the total annual revenue requirement.

#### Net Present Value of Revenue

The present value (PV) was then calculated for each of the first twenty (20) years of the annual revenue requirements. The discount factor that was applied is consistent with the rate used in the Independent Evaluator's Report.

#### Levelized Revenue

The total calculated present value of the annual revenue requirements was then divided by the sum of each of the present value factors to derive the levelized revenue requirement for the twenty-year period. The leveled revenue requirement calculated is the same as the net present value (NPV) of the annual revenue requirements.



Annual Energy

The annual energy amount (MWh) used is the committed energy to be supplied as part of the purchase power agreement with the Massachusetts electric distribution companies. This is the same value used in the Independent Evaluator's Report.

Real Levelized \$/MWh

The annual levelized revenue requirement was then divided by the annual energy amount to calculate the real levelized \$/MWh. The resulting \$9/MWh represents the incremental cost, or alternatively a negative net benefit, from the addition of 54 miles of underground.

Net Total Benefit – Independent Evaluator Report

\$40.02 is the Net Total Benefit for the NECEC Project pulled directly from Appendix F of the Independent Evaluator's Report.

Net Total Benefit With 54 Miles of Underground

The \$31.02 Net Total Benefit was calculated by starting with the actual Net Total Benefit from the Independent Evaluator's Report (\$40.02) and subtracting \$9/MWh in costs, or net benefits, representing the addition of 54 miles of underground.

Net Total Benefit – Rank 8

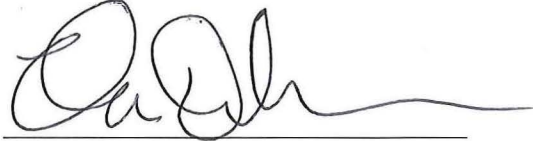
\$32.62 is the Net Total Benefit for the eighth ranked project, pulled directly from Appendix F of the Independent Evaluator's Report.

Net Total Benefit – Rank 9

\$30.61 is the Net Total Benefit for the ninth ranked project, pulled directly from Appendix F of the Independent Evaluator's Report.

Dated: 4/29/19

Respectfully submitted,



Thorn Dickinson

STATE OF MAINE  
Cumberland, ss.

The above-named Thorn Dickinson did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Before,

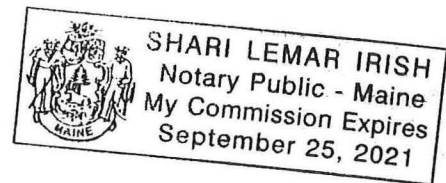
Dated: 4/29/19

Shari Lemar Irish

Notary Public

Name: Shari Lemar Irish

My Commission Expires:



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED SUPPLEMENTAL TESTIMONY AND EXHIBIT OF  
GERRY J. MIRABILE

May 1, 2019

This testimony is in response to the questions in Appendix A of the Department of Environmental Protection's (DEP's) Tenth Procedural Order. The DEP requested supplemental information and evidence on whether undergrounding, tapering, or taller pole structures in certain areas are technically feasible and economically viable minimization or mitigation measures, and whether any of these techniques would satisfy concerns raised at the hearing or be

a preferred alternative. Tenth Procedural Order ¶ 2. As explained in the CMP witnesses' answers to Appendices A and B of the Tenth Procedural Order (a listing of which is attached as Exhibit CMP-2.2-A), undergrounding, tapering, or taller pole structures in areas not already proposed for them by CMP may be technically feasible and economically viable minimization or mitigation measures only if limited to certain areas. However, even if these techniques are limited to certain areas, as discussed in the Supplemental Testimony of Mark Goodwin and of Gino Giumarro, they are only marginally valuable as minimization or mitigation measures. Because these techniques would be only marginally, if at all, useful to satisfy concerns raised at the hearing, use of any of these measures beyond those areas already proposed is not a preferred alternative.

**QUESTION 1: TYPICAL CONSTRUCTION DETAILS AND SECTIONS FOR THE AREAS PROPOSED FOR TAPERING. CLARIFY WHETHER DURING INITIAL CONSTRUCTION THE ENTIRE 150-FOOT CORRIDOR IS CLEARED, OR IF ONLY THE WIRE ZONE IS CLEARED AND THE REMAINING WIDTH SELECTIVELY CUT.**

Typically, during initial construction the entire 150-foot corridor would not be cleared. For visual tapering, only the wire zone would be cleared of capable vegetation (i.e., woody species and specimens capable of growing into the conductor safety zone) and most or all of the remaining width would be selectively cut to achieve the tapered effect. Areas proposed for tapering, whether for the purpose of deer winter travel corridors or for the purpose of minimizing visual impacts, would be created and managed similarly during construction.

During construction, the full 150-foot right of way width would be cleared of capable trees only if all trees in an area proposed for tapering were either intruding into the conductor

safety zone at their then-current height, or if all trees in an area proposed for tapering were anticipated to grow into the conductor safety zone prior to the next scheduled maintenance. Otherwise, tree retention and removal would be selective to create and maintain tapering, as described below. For a typical cross section detail of vegetation tapering, refer to page 101 of 273 of the February 28, 2019 Pre-Filed Direct Testimony of Amy Segal.

Within the Upper Kennebec Deer Wintering Area, deer travel corridors will be managed as softwood stands. Trees will be allowed to remain and grow to the maximum tree height that can practically be maintained without encroaching into the conductor safety zone or into the necessary cleared area adjacent to each structure. Maximum tree heights within these tapered areas will vary based on structure height, conductor sag, and topography, but will generally range from 25 to 35 feet. During construction, hardwood and softwood species that would intrude into the conductor safety zone or are at risk of growing into the conductor safety zone prior to the next scheduled vegetation maintenance will be cut at ground level and removed. Softwood specimens that would not intrude into the conductor safety zone, and are not at risk of growing into the conductor safety zone prior to the next scheduled maintenance, will be retained.

Within the areas proposed for tapering to minimize their visual impact at Coburn Mountain (Upper Enchanted Township) and Three Slide Mountain (T5R6 BKP WKR), depending upon tree age classes, distribution, density, and species, capable trees outside of the wire zone in these tapered locations will either be retained, or will be allowed to grow up and maintained in a tapered configuration to the extent practicable, with heights ranging from 25 feet (from the outer edges of the wire zone for a distance of approximately 20 feet on each side) to 35 feet (from the outer edges of the 25 foot tall areas to the edges of the maintained right of way, for



a distance of approximately 20 feet on each side). Capable vegetation will be selectively cut during periodic routine maintenance cycles to remove individual specimens likely to either grow into the conductor safety zone prior to the next scheduled maintenance cycle, or likely to grow taller than the above target heights prior to the next scheduled maintenance cycle.

In summary, during initial construction the entire 150-foot corridor is not, in general, proposed to be cleared for areas proposed for tapering. Rather, only the wire zone is cleared and the remaining width selectively cut. However, if areas to be tapered are comprised of even-aged trees which extend into the conductor safety zone, or which would do so prior to the next scheduled maintenance, most or all of these trees would be removed during construction, and these areas would grow into, and be maintained in, their tapered configuration.

**QUESTION 21: EXPLANATION OF WHY TAPERING VEGETATION IS MORE EXPENSIVE THAN KEEPING THE ENTIRE 150-FOOT ROW TO SCRUB SHRUB HEIGHT.**

CMP practices integrated vegetation management (IVM), including the selective use of herbicides, to safely and effectively maintain its transmission line corridors in a scrub/shrub cover. IVM practices reduce the need for pesticides, and include techniques such as manual, mechanical, and chemical vegetation management. When practiced properly and long-term, IVM of transmission rights of way typically produces and maintains lush scrub/shrub and herbaceous growth that does not interfere with overhead lines.

Systemic herbicides are part of IVM, and these herbicides control capable (tall) woody vegetation through absorption by foliage or roots and transport to other parts of the plant, effectively killing individual specimens. CMP contractor crews utilize hand-pressurized

backpack-mounted sprayers to apply herbicides to individual specimens, and to absolutely minimize drift of herbicides off-target CMP contractor crews do not spray herbicides at vegetation taller than 8 feet.

The use of systemic herbicides reduces the need for subsequent control of unwanted specimens and species, thereby reducing future labor and material costs. Also, because IVM includes application of herbicides to cut stumps, coppicing (described below) is minimized or avoided. As a result, IVM management cycles to maintain scrub/shrub are no more frequent than once every four years. Nevertheless, CMP will not apply herbicides in the 53.5 miles of new corridor in Segment 1. Instead, CMP will utilize mechanical methods for vegetation maintenance on this portion of the Project.

Because tapered trees range from 15 to 35 feet tall, these trees also would be managed by crews on foot from the ground and cut back to ground level by mechanical means, primarily chainsaws. Mechanical management of vegetation in a tapered configuration, however, is significantly more labor-intensive and expensive than mechanical management to maintain a scrub/shrub cover. As described below, mechanical management of tapering requires significant evaluation and inspection that is not required of ground crews who are simply removing all growth above a certain height to maintain a scrub/shrub cover.

Vegetation management for tapering would be extremely labor-intensive and expensive, requiring the visibility of tree tops and the gauging of tree heights relative to the conductor safety zone within tapered areas in order to selectively target and remove individual specimens that were already within the conductor safety zone, or were anticipated to grow into the conductor safety zone prior to the next scheduled maintenance cycle.

After cutting, these trees ranging from 15 to 35 feet would need to be removed. There also exists the risk that, due to poor visibility of or access to trees within tapered areas, individual trees may intrude into the conductor safety zone despite best efforts to avert this.

Also, because trees in tapered areas would be managed mechanically and without herbicides, coppicing of certain species would be widespread. Coppicing creates often dense stands of multiple-stemmed woody growth that, within a tapered area of transmission line corridor, would require subsequent intensive mechanical removal to maintain a safe and operable transmission line.

As a result of the above, and because of the less reliable and less certain control of woody vegetation in tapered areas, mechanical vegetation management in tapered areas would be conducted on a two- or three-year cycle, rather than a four year cycle.

For all of these reasons, tapering vegetation is significantly more expensive than maintaining the entire 150-foot right of way in scrub/shrub.

### Exhibits

Exhibit CMP-2.2-A: List of Appendix A and Appendix B Responses

Dated: 4/25/2019

Respectfully submitted,

Gerry J. Mirabile  
Gerry Mirabile

STATE OF MAINE

Kennebec ss.

The above-named Gerry Mirabile did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Dated: April 25, 2019

Before,

Alice Richards

Notary Public

Name: Alice Richards

My Commission Expires:

January 4, 2026



**LIST OF APPENDIX A AND APPENDIX B WITNESS RESPONSES****Appendix A to the Tenth Procedural Order****Construction Questions:**

1. Typical construction details and sections for the areas proposed for tapering. Clarify whether during initial construction the entire 150-foot corridor is cleared, or if only the wire zone is cleared and the remaining width selectively cut.
  - Gerry Mirabile
2. Description of construction process, staging, and impacts for 100-foot or taller poles.
  - Nick Achorn
3. A more detailed description of undergrounding techniques including direct burial, duct bank installation, or trenchless installation. This should also include typical dimensions, materials and cross-section diagrams.
  - Justin Bardwell
4. A description of the differences of normal operation and maintenance (O&M) activities between overhead and underground lines.
  - Justin Bardwell
5. Whether fewer longer sections (versus more shorter sections) of the line could be undergrounded that would minimize both the number of transition stations as well as the environmental impact of the project.
  - Justin Bardwell
6. Explanation of why a permanent road would need to be constructed to each splice location (undergrounding), but not for overhead poles. Explanation of why matting along the ROW (which could be used for overhead poles) could not be used for splice boxes.
  - Justin Bardwell
7. How the determination was made that a 75-foot wide cleared width would be necessary for a potential underground line.
  - Justin Bardwell
8. Whether there is more cleared area with a 150-foot wide overhead line or with a 75-foot wide underground line including termination stations.
  - Justin Bardwell
9. Explanation of the number or percentage of cable faults in underground cables vs. overhead lines.
  - Justin Bardwell



10. Whether cooling station structures were included in the undergrounding cost estimates, what size or type of structure would be needed, how many, and at what distances along the line.
  - Justin Bardwell
11. Identify engineering standards, safety or design codes, etc. that specifically apply to this project.
  - Justin Tribbet/Justin Bardwell
12. Explanation of the conditions considered when engineers determined that horizontal directional drilling would be the lowest impact trenchless method for the NECEC Project.
  - Justin Bardwell

Environmental Questions:

13. Whether taller poles and travel corridors could provide enough of a link between the habitat on both sides of the corridor for species like the pine marten.
  - Gino Giumarro
14. In TNC's nine areas of concern, whether travel corridors must be located within a certain distance of the structures (poles), and what the minimum width would be of the travel corridors in order for species like the pine marten to use them.
  - Gino Giumarro
15. In TNC's nine areas of concern, whether tapering would adequately reduce the forest fragmentation of any clearing.
  - Gino Giumarro
16. Locations where tapering vs. taller overhead poles would be preferred.
  - Mark Goodwin/Lauren Johnston
  - Terry DeWan/Amy Segal
17. Whether tapering within the 100-foot buffers around streams would provide adequate large woody vegetation for streams in segment 1 which are typically less than 10 feet wide.
  - Mark Goodwin/Lauren Johnston

Cost/Financial Questions:

18. A description of the differences of normal operation and maintenance (O&M) costs between overhead and underground lines.
  - Justin Tribbet
19. What the costs would be to underground fewer longer sections (versus more shorter sections) of the line (to minimize transition stations and environmental impact) as well as other practical constraints to this approach.
  - Justin Bardwell

20. Comparison of cost for constructing a crane path to every pole location (overhead lines) with the cost to construct an access road to every splice box (undergrounding).
  - Justin Bardwell
21. Explanation of why tapering vegetation is more expensive than keeping the entire 150-foot ROW to scrub shrub height.
  - Gerry Mirabile
22. Additional description of allowance for funds used during construction (AFDUC), and whether there is any AFUDC included in the \$950 million original project cost estimate.
  - Thorn Dickinson
23. What the difference is between conceptual level estimates and preliminary estimates, and how final construction-level cost estimates compare to conceptual level cost estimates.
  - Justin Tribbet
24. Whether the original \$950 million cost estimate included indirect costs such as CMP and Avangrid personnel.
  - Thorn Dickinson

Routing Questions:

25. Explanation of how the connection point was chosen on the Quebec/Maine border, and whether this was decided by Hydro-Quebec or real estate constraints. Whether there is flexibility in this location or if there are other tie-in points on the Quebec border.
  - Ken Freye
26. Whether an underground route co-located with Route 201 would be technically feasible, economically viable, and/or a satisfactory option to mitigate concerns raised during the hearing.
  - Ken Freye/Justin Bardwell

**Appendix B to the Tenth Procedural Order**

The applicant is requested to provide additional documents by May 1st on the following items:

1. Data was provided from the Maine Forest Service for 2015-2017 on acres of forest that were clear cut (See Mark Goodwin rebuttal testimony, page 18). Please provide this same data for multiple years/decades prior to 2015 so as to determine long term trends in clear cutting acreage.
  - Mark Goodwin/Lauren Johnston
2. The Application stated that Plum Creek Maine Timberlands LLC “specifically did not want a transmission line located along the Spencer Road.” Please provide evidence from the landowner to that effect.
  - Ken Freye

3. A plan showing the alternate route noted in Section 3 of Mr. Bardwell's rebuttal testimony.
  - Justin Bardwell
4. For all the cost estimate summary sheets in the rebuttal testimony, please provide additional backup spreadsheets or details for how each of the line item costs were determined.
  - Justin Bardwell/Justin Tribbet/Thorn Dickinson

STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
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Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED SUPPLEMENTAL TESTIMONY AND EXHIBIT OF  
MARK GOODWIN

May 1, 2019

This testimony is in response to the questions and data requests in the Tenth Procedural Order.

**I. APPENDIX A TO THE TENTH PROCEDURAL ORDER**

In this supplemental testimony, I respond to certain of the Environmental Questions the DEP asked in Appendix A to the Tenth Procedural Order.

**QUESTION 16: LOCATIONS WHERE TAPERING VS. TALLER OVERHEAD POLES WOULD BE PREFERRED.**

My pre-filed direct testimony discussed CMP's consultation with the Maine Department of Inland Fisheries and Wildlife ("MDIFW") and the inclusion of MDIFW's recommendations into CMP's proposed Compensation Plan, demonstrating that there will be no unreasonable impact or adverse effects to wildlife due to diminished habitat connectivity. Thus, although taller vegetation and associated habitat would benefit some species, CMP has demonstrated that its proposed clearing and vegetation management practices will not cause an unreasonable impact or an adverse effect. Therefore, neither tapering nor taller structures are necessary or appropriate.

To the extent one or the other were required, though, tapering would be preferable to taller overhead structures in all locations identified by the intervenors because of cost, safety, reliability, and environmental and visual impact considerations. Tapering would present significant challenges; however, these challenges would be less than those associated with managing vegetation at full height by using taller structures.

For instance, if tapering were required (even though it is unnecessary and offers few environmental benefits), it would be preferable to taller structures from a visual perspective because of the potential for taller structures to cause adverse visual impacts to scenic resources. Tapering would consist of the maintenance of the wire zone as it is currently proposed in Exhibit 10-1 and 10-2 of CMP's Site Law application (revised versions filed on January 30, 2019), with taller trees being allowed to grow outside of the wire zone. Additionally, tapered vegetation would be maintained on a regular cycle, mitigating some of the safety, reliability and environmental impacts and risks.



From a vegetation maintenance perspective, allowing full height canopy by using taller structures may present the following negative safety, environmental, reliability, and cost concerns, which tapering does not present:

### Safety

- Removal of taller and larger vegetation during maintenance cycles would require more mechanical work using heavy equipment, which is inherently more dangerous than work performed by hand.
- Climbing trees may be required for larger tree removal, putting workers in closer proximity to energized conductors and increasing the risk of falls.
- Hand felling of larger capable species within riparian areas would be dangerous to workers on the ground, especially when attempting to fell trees in a desired direction away from the resource.

### Environmental

- Heavy equipment (bucket trucks, skidders, excavators, and timber forwarders etc.) used during vegetation maintenance to remove any taller tree within the conductor safety zone or forecast to grow into the conductor safety would increase vegetation damage and soil compaction that would not normally be associated with vegetation maintenance.
- Deployment of timber mats, while reducing soil compaction, would also require heavy equipment, increasing the number of trips up and down the ROW and potentially increasing ground and disturbance of sensitive and protected natural resources.
- Cable skidding (i.e., dragging) increased amounts and larger pieces of slash, associated with taller vegetation, outside of the riparian buffers to comply with the Maine Slash Law would create additional ground disturbance and impacts to vegetation.
- Increased heavy equipment operation would increase the potential and likelihood of spills of fuel, oil, and hydraulic fluids.
- Allowing full height vegetation to remain would require taller structures and potentially closer spaced structures, which may introduce additional visual/aesthetic impacts and potentially more direct fill in protected natural resource areas.

### Reliability

- Allowing full height capable vegetation to grow beneath the conductors would result in limited access and work area for operations and emergency response personnel.
- Accurately measuring or estimating the heights of individual trees, and their distance from energized conductors, in order to identify individual trees to be removed, could be difficult in dense growth, increasing safety hazards associated with minimum approach distance from the transmission line and potentially resulting in line outages from tree growth into conductors.

### Cost

- Additional structures may be required to shorten the span length and minimize conductor sag to allow taller trees. The incremental cost for each additional structure or replacing a typical structure with a taller structure is \$115,000 to \$243,000, depending on structure type and foundation requirements.

Consultation with the MDIFW, the resource agency experts in Maine on these subjects, resulted in the recommendation for full height vegetation and tapering only in those areas included in CMP's Compensation Plan. Therefore, if DEP concludes that it is appropriate to taper vegetation in additional areas, this should be limited to those areas having higher value wildlife features and are known to be used specifically as travel corridors for wildlife, i.e., riparian buffers.

As such, CMP evaluated each of the polygons included in The Nature Conservancy's pre-filed direct testimony, and focused its review by assessing the locations of significant features within these polygons, i.e., perennial streams known to include brook trout, state-listed threatened and/or special concern species, significant vernal pools, deer wintering areas, inland waterfowl and wading bird habitat, and unique natural communities.

The table below indicates where, based on the foregoing criteria, tapered vegetation could be useful, although only marginally and incrementally, if required by DEP.

| <b>TNC Area<sup>1</sup></b> | <b>Length (Miles)</b> | <b>Rationale for Evaluating Locations Appropriate for Tapering if Required by MDEP</b>                                                                                                                             | <b>Comments</b>                                                                                                                                                                                                                                                 |
|-----------------------------|-----------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                           | 1.63                  | TNC Area 1 does not contain known brook trout habitat, T&E species, or SVPs.                                                                                                                                       | Lack of higher value wildlife features in TNC Polygon 1.                                                                                                                                                                                                        |
| 2                           | 1.39                  | Includes S. Branch Moose River (Roaring Brook Mayfly habitat). No known brook trout waterbodies or SVP habitat.                                                                                                    | Tapering if required by MDEP should be restricted to the area between structure 767 and 768, which spans the South Branch of the Moose River.                                                                                                                   |
| 3                           | 1.23                  | Includes two waterbodies identified as Northern Spring Salamander habitat. No brook trout or SVP habitat identified.                                                                                               | Tapering if required by MDEP should be restricted to the area between structures 752 and 753, and between structures 757 and 758, both of which span Northern Spring Salamander habitat.                                                                        |
| 4                           | 3.15                  | Includes the full height canopy area proposed by CMP at Gold Brook between structures 731-735, and tapered vegetation between structures 735-737. Baker Stream north of Rock Pond is brook trout habitat.          | If required by MDEP, tapering would be preferred at Baker Stream north of Rock Pond due to the increased visual impact taller structures would have in this location.                                                                                           |
| 5                           | 4.22                  | Includes Spencer Stream and tributaries (brook trout and IWWH), Whipple Brook (brook trout) and Bitter Brook (includes IWWH but is not identified as brook trout or T&E habitat) and Jack Pine Forest communities. | If required by MDEP tapering would be preferred in the spans associated with Spencer Stream (Structures 701-702 and 703-704), Whipple Brook (Structures 693-694), and Bitter Brook and adjacent JackPineWood004 and JackPineWood005 (Structures 684-688)        |
| 6                           | 2.45                  | Rusty Blackbird habitat vegetation management already addresses a portion of this area; no other higher value areas identified.                                                                                    | No other higher value wildlife features were identified. However, if required by MDEP, additional tapering beyond what is already proposed in Rusty Blackbird habitat, would be preferred at Piel Brook and associated IWWH (Structures 653-654)                |
| 7                           | 0.72                  | The only higher value wildlife feature is Bicknell's thrush habitat.                                                                                                                                               | In the event MDEP determines it is necessary, tapering of the ROW within the Bicknell's thrush habitat (between Structures 638 and 643) would be preferred because this species prefers habitat with a history of disturbance causing stunted dense understory. |
| 8                           | 3.71                  | Includes Tomhegan Stream and tributaries to Cold Stream.                                                                                                                                                           | If required by MDEP, tapering would be preferred within riparian areas associated with perennial coldwater streams (Structures 567-568, 573-574, and 575-576).                                                                                                  |
| 9                           | 3.68                  | Upper Kennebec DWA; MDIFW has accepted CMP's proposed travel corridors as effective and appropriate to maintain habitat connectivity.                                                                              | CMP recommends implementing the proposed tapered travel corridors previously agreed to with MDIFW.                                                                                                                                                              |

1: TNC Areas 1 through 9 proceed from West to East and are depicted on Exhibit 7 of the TNC Pre-filed direct testimony.

**QUESTION 17: WHETHER TAPERING WITHIN THE 100-FOOT BUFFERS AROUND STREAMS WOULD PROVIDE ADEQUATE LARGE WOODY VEGETATION FOR STREAMS IN SEGMENT 1 WHICH ARE TYPICALLY LESS THAN 10 FEET WIDE.**

Because tapering around coldwater fisheries would result in an incremental increase in large woody debris input into smaller stream channels, it follows that the addition of tapered vegetation management practices in the riparian buffers of perennial coldwater streams would provide adequate large woody vegetation for streams less than 10 feet wide. However, consultation between CMP and MDIFW did not indicate that such tapering was necessary or that the removal of full height forest canopy in riparian buffers across a 150-foot-wide right-of-way (“ROW”) would be unreasonable or would create an adverse effect through the loss of woody debris inputs into stream channels. In fact, CMP proposed a practice that would have simulated and had very similar effects to large woody debris input under natural conditions in forested habitats adjacent to coldwater fisheries; specifically, CMP proposed additions of wood, known as “chop and drop,” as one of several mitigation measures for indirect coldwater fisheries impacts, and MDIFW rejected this idea apparently because it considered the reduction in woody debris inputs resulting from the proposed clearing within riparian buffers to be insignificant.

With respect to shading and insolation for streams that are 10 feet wide or less (the majority on Segment 1), there will be significant shading by lower growing overhanging vegetation through the implementation of CMP’s vegetation management practices in riparian buffers. CMP’s current proposal is appropriate and adequate in addressing shading and woody debris inputs and will not create unreasonable impacts or adverse effects to these waterbodies.

## **II. APPENDIX B TO THE TENTH PROCEDURAL ORDER**

Appendix B to the Tenth Procedural Order includes requests for additional supporting data. In this supplemental testimony I will respond to the item specific to Maine Forest Service data.

**ITEM 1, DATA WAS PROVIDED FROM THE MAINE FOREST SERVICE FOR 2015-2017 ON ACRES OF FOREST THAT WERE CLEAR CUT (SEE MARK GOODWIN REBUTTAL TESTIMONY, PAGE 18). PLEASE PROVIDE THIS SAME DATA FOR MULTIPLE YEARS/DECADES PRIOR TO 2015 SO AS TO DETERMINE LONG TERM TRENDS IN CLEAR CUTTING ACREAGE.**

The data provided from the Maine Forest Service is provided in the attached exhibit CMP-3.2-A and is also accessible through the Department of Agriculture, Conservation, and Forestry at the following website:

[https://www.maine.gov/dacf/mfs/publications/annual\\_reports.html](https://www.maine.gov/dacf/mfs/publications/annual_reports.html)

A summary of acreage clear cut in Franklin County and Somerset County for the years 2000 to 2017 is provided below:




| Year | Franklin County              |                            |                            |  | Somerset County              |                            |                            |
|------|------------------------------|----------------------------|----------------------------|--|------------------------------|----------------------------|----------------------------|
|      | # of Clear Cuts<br>>75 acres | Average<br>Size<br>(Acres) | Total Clear<br>Cut (Acres) |  | # of Clear Cuts<br>>75 acres | Average<br>Size<br>(Acres) | Total Clear<br>Cut (Acres) |
| 2000 | 0                            | 31                         | 1,040                      |  | 0                            | 32                         | 3,051                      |
| 2001 | 0                            | 28                         | 1,352                      |  | 0                            | 24                         | 1,841                      |
| 2002 | 0                            | 31                         | 2,070                      |  | 0                            | 18                         | 2,899                      |
| 2003 | 0                            | 42                         | 2,459                      |  | 0                            | 21                         | 5,877                      |
| 2004 | 0                            | 32                         | 1,456                      |  | 0                            | 19                         | 7,694                      |
| 2005 | 0                            | 37                         | 633                        |  | 1                            | 22                         | 6,079                      |
| 2006 | 0                            | 25                         | 925                        |  | 0                            | 22                         | 6,038                      |
| 2007 | 1                            | 39                         | 1,144                      |  | 0                            | 20                         | 4,462                      |
| 2008 | 0                            | 38                         | 545                        |  | 0                            | 24                         | 2,134                      |
| 2009 | 0                            | 21                         | 1,742                      |  | 0                            | 23                         | 5,783                      |
| 2010 | 0                            | 24                         | 2,122                      |  | 0                            | 18                         | 6,969                      |
| 2011 | 4                            | 22                         | 2,014                      |  | 0                            | 20                         | 6,059                      |
| 2012 | 4                            | 19                         | 2,033                      |  | 0                            | 20                         | 6,614                      |
| 2013 | 4                            | 24                         | 3,259                      |  | 1                            | 19                         | 6,364                      |
| 2014 | 3                            | 24                         | 2,751                      |  | 2                            | 21                         | 7,746                      |
| 2015 | 7                            | 28                         | 3,060                      |  | 3                            | 21                         | 6,377                      |
| 2016 | 7                            | 34                         | 3,175                      |  | 2                            | 22                         | 5,507                      |
| 2017 | 11                           | 49                         | 3,604                      |  | 4                            | 22                         | 5,685                      |

Exhibits:

CMP-3.2-A: Maine Forest Service Data

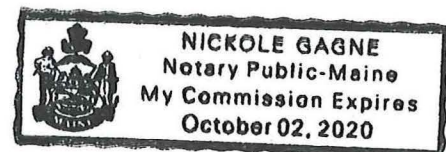
Dated: 4.29.2019

Respectfully submitted,

  
Mark GoodwinSTATE OF MAINE  
CUMBERLAND, ss.  
COUNTY

The above-named Mark Goodwin did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Before,

Dated: 4/29/19  
Notary PublicName: NICKOLE GAGNEMy Commission Expires: 10/02/20

# 2000

## Silvicultural Activities Report

**including Annual Report on Clearcutting**

Compiled from the 2000 Landowner Reports and other survey instruments.  
Data collected under the provisions of Title 12 MRSA §8885 and §8878-A

Published:  
May 25, 2001



DEPARTMENT OF CONSERVATION  
MAINE FOREST SERVICE  
#22 STATE HOUSE STATION  
AUGUSTA ME 04333  
(207)287-2791 OR 1-800-367-0223(instate)  
<http://www.state.me.us/doc/mfs/mfshome.htm>

printed under appropriation 010-04A-5400-552

## Report Highlights

### Timber Harvesting:

- The total area harvested has increased 5%, from 537,333 acres in 1999 to 566,685 acres in 2000.
- The total area partially harvested increased 6%, from 513,212 acres in 1999 to 546,956 acres in 2000.

### Clearcutting:

- The total area clearcut decreased by 26%, from 18,754 acres in 1999 to 13,838 acres in 2000.

The total area clearcut in 2000 is the lowest since data collection began in 1982.

Clearcutting made up 2.5% of the total harvesting acres in 2000.

The average size clearcut in 2000 was 21 acres statewide. Landowners owning more than 100,000 acres had an average clearcut size of 24 acres. Landowners owning less than 100,000 acres had an average clearcut size of 12 acres.

Landowners owning more than 100,000 acres in Maine created 85% of all clearcuts (11,781 acres). 98% of these clearcuts were smaller than 75 acres. The highest rate of clearcutting for an individual landowner was 0.6% of total statewide ownership.

The dominant silvicultural reason for clearcutting, reported by the large landowners, was for areas where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

### Land Use Changes:

- Harvesting to convert land from forest management to some other primary land use increased 1% from 5,367 to 5,891 acres.

### Herbicide Use:

- For site preparation decreased 61%, from 2,469 acres to 962 acres.
- To release crop trees from competing vegetation decreased 17%, from 28,906 acres to 24,091 acres.

### Timber Stand Improvement (TSI):

- Thinning of young stands with saws increased 41%, from 17,486 acres to 24,590 acres. 87% of this activity was done by landowners owning more than 100,000 acres.

### Planting:

- Tree planting decreased 12%, from 12,859 acres to 11,341 acres. 95% of the planting was by landowners owning more than 100,000 acres. The predominant species planted was spruce.

### Professional Assistance:

- The harvest acres supervised by licensed foresters increased 15%, from 368,403 acres to 424,426 acres. 75% of all harvest acres in 2000 had a licensed professional forester involved.

### \*Footnote:

The revised Maine Forest Service Rules - Chapter 20: Forest Regeneration and Clearcutting Standards that took effect in October 1999 require 60 days preharvest notification on-site review by Maine Forest Service staff for any clearcut proposed to exceed 75 acres. The clearcuts reported in 2000 that exceed 75 acres in 2000 were notified and begun under the old Chapter 20 Rules.

## 2000 Harvesting and Land Use Changes

| Commercial Harvest Information by Landowner Size and Type |                        | Acres          |                |               |                 |                |
|-----------------------------------------------------------|------------------------|----------------|----------------|---------------|-----------------|----------------|
|                                                           |                        | Selection      | Shelterwood    | Clearcut      | Land Use Change | Total Harvest  |
| <b>Forest Industry Land</b>                               | 1 to 100 acres         | 110            | 0              | 0             | 0               | 110            |
|                                                           | 101 to 1,000 acres     | 9,170          | 1,539          | 51            | 27              | 10,787         |
|                                                           | 1,001 to 100,000 acres | 30,040         | 4,181          | 1,022         | 85              | 35,328         |
|                                                           | 100,000 + acres        | 55,123         | 84,462         | 9,786         | 263             | 149,634        |
|                                                           | <b>SubTotal</b>        | <b>94,443</b>  | <b>90,182</b>  | <b>10,859</b> | <b>375</b>      | <b>195,859</b> |
| <b>Institutional Investor Timberlands</b>                 | 1 to 100 acres         | 0              | 0              | 0             | 0               | 0              |
|                                                           | 101 to 1,000 acres     | 0              | 0              | 0             | 0               | 0              |
|                                                           | 1,001 to 100,000 acres | 1,148          | 480            | 0             | 0               | 1,628          |
|                                                           | 100,000 + acres        | 37,410         | 53,756         | 1,907         | 0               | 93,073         |
|                                                           | <b>SubTotal</b>        | <b>38,558</b>  | <b>54,236</b>  | <b>1,907</b>  | <b>0</b>        | <b>94,701</b>  |
| <b>Non-Industrial Land</b>                                | 1 to 100 acres         | 56,978         | 7,628          | 402           | 3,262           | 68,270         |
|                                                           | 101 to 1,000 acres     | 76,707         | 13,213         | 226           | 1,627           | 91,773         |
|                                                           | 1,001 to 100,000 acres | 61,014         | 5,055          | 229           | 363             | 66,661         |
|                                                           | 100,000 + acres        | 10,512         | 21,649         | 88            | 0               | 32,249         |
|                                                           | <b>SubTotal</b>        | <b>205,211</b> | <b>47,545</b>  | <b>945</b>    | <b>5,252</b>    | <b>258,953</b> |
| <b>Other woodlands (Govt, etc.)</b>                       | 1 to 100 acres         | 362            | 62             | 0             | 54              | 478            |
|                                                           | 101 to 1,000 acres     | 1,367          | 41             | 70            | 111             | 1,589          |
|                                                           | 1,001 to 100,000 acres | 2,041          | 1,090          | 57            | 84              | 3,272          |
|                                                           | 100,000 + acres        | 9,485          | 2,333          | 0             | 15              | 11,833         |
|                                                           | <b>SubTotal</b>        | <b>13,255</b>  | <b>3,526</b>   | <b>127</b>    | <b>264</b>      | <b>17,172</b>  |
| <b>2000 Totals:</b>                                       |                        | <b>351,467</b> | <b>195,489</b> | <b>13,838</b> | <b>5,891</b>    | <b>566,685</b> |
| <b>Percent of 2000 Harvest:</b>                           |                        | <b>62.02%</b>  | <b>34.50%</b>  | <b>2.44%</b>  | <b>1.04%</b>    | <b>100.00%</b> |
| <b>1999 Totals:</b>                                       |                        | <b>368,355</b> | <b>144,857</b> | <b>18,754</b> | <b>5,367</b>    | <b>537,333</b> |
| <b>Percent Change from 1999 to 2000:</b>                  |                        | <b>-5%</b>     | <b>35%</b>     | <b>-26%</b>   | <b>10%</b>      | <b>5%</b>      |



## 2000 Precommercial Activities and Professional Assistance

| OwnershipType*Ownership Size       |                        | Precommercial Activities<br>by Landowner Size and Type |         |        |                  | Licensed Professional Forester Use<br>by Landowner Size and Type |                       |                |
|------------------------------------|------------------------|--------------------------------------------------------|---------|--------|------------------|------------------------------------------------------------------|-----------------------|----------------|
|                                    |                        | Acres                                                  |         |        |                  | Landowner<br>Reports<br>Received                                 | Forester Involved     |                |
|                                    |                        | Herbicide Use                                          |         | TSI    | Tree<br>Planting |                                                                  | Number of<br>Harvests | Total<br>Acres |
|                                    |                        | Site Prep                                              | Release |        |                  |                                                                  |                       |                |
| Forest Industry Land               | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                | 2                                                                | 1                     | 100            |
|                                    | 101 to 1,000 acres     | 0                                                      | 0       | 265    | 3                | 188                                                              | 53                    | 3,596          |
|                                    | 1,001 to 100,000 acres | 5                                                      | 448     | 311    | 298              | 158                                                              | 115                   | 23,467         |
|                                    | 100,000 + acres        | 645                                                    | 17,550  | 18,568 | 9,753            | 319                                                              | 316                   | 146,271        |
|                                    | Subtotal               | 650                                                    | 17,998  | 19,144 | 10,054           | 667                                                              | 485                   | 173,434        |
| Institutional Investor Timberlands | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                | 0                                                                | 0                     | 0              |
|                                    | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                | 0                                                                | 0                     | 0              |
|                                    | 1,001 to 100,000 acres | 0                                                      | 0       | 0      | 0                | 7                                                                | 5                     | 1,258          |
|                                    | 100,000 + acres        | 98                                                     | 5,843   | 1,655  | 986              | 122                                                              | 119                   | 91,593         |
|                                    | Subtotal               | 98                                                     | 5,843   | 1,655  | 986              | 129                                                              | 124                   | 92,851         |
| Non-Industrial Land                | 1 to 100 acres         | 10                                                     | 25      | 1,046  | 72               | 3,061                                                            | 817                   | 19,638         |
|                                    | 101 to 1,000 acres     | 4                                                      | 0       | 1,180  | 182              | 1,872                                                            | 767                   | 37,003         |
|                                    | 1,001 to 100,000 acres | 200                                                    | 200     | 305    | 21               | 314                                                              | 239                   | 58,870         |
|                                    | 100,000 + acres        | 0                                                      | 0       | 1,075  | 0                | 111                                                              | 108                   | 31,849         |
|                                    | Subtotal               | 214                                                    | 225     | 3,606  | 275              | 5,358                                                            | 1,931                 | 147,360        |
| Other woodlands (Govt, etc.)       | 1 to 100 acres         | 0                                                      | 0       | 1      | 0                | 17                                                               | 9                     | 231            |
|                                    | 101 to 1,000 acres     | 0                                                      | 25      | 165    | 20               | 39                                                               | 30                    | 1,334          |
|                                    | 1,001 to 100,000 acres | 0                                                      | 0       | 15     | 6                | 42                                                               | 33                    | 2,983          |
|                                    | 100,000 + acres        | 0                                                      | 0       | 4      | 0                | 40                                                               | 37                    | 6,233          |
|                                    | Subtotal               | 0                                                      | 25      | 185    | 26               | 138                                                              | 109                   | 10,781         |
| 2000 Totals:                       |                        | 962                                                    | 24,091  | 24,590 | 11,341           | 6,292                                                            | 2,649                 | 424,426        |
| 1999 Totals:                       |                        | 2,469                                                  | 28,906  | 17,486 | 12,859           | 6,954                                                            | 2,346                 | 368,403        |
| Change from 1999 to 2000:          |                        | -61%                                                   | -17%    | 41%    | -12%             | -10%                                                             | 13%                   | 15%            |

**Definitions:**

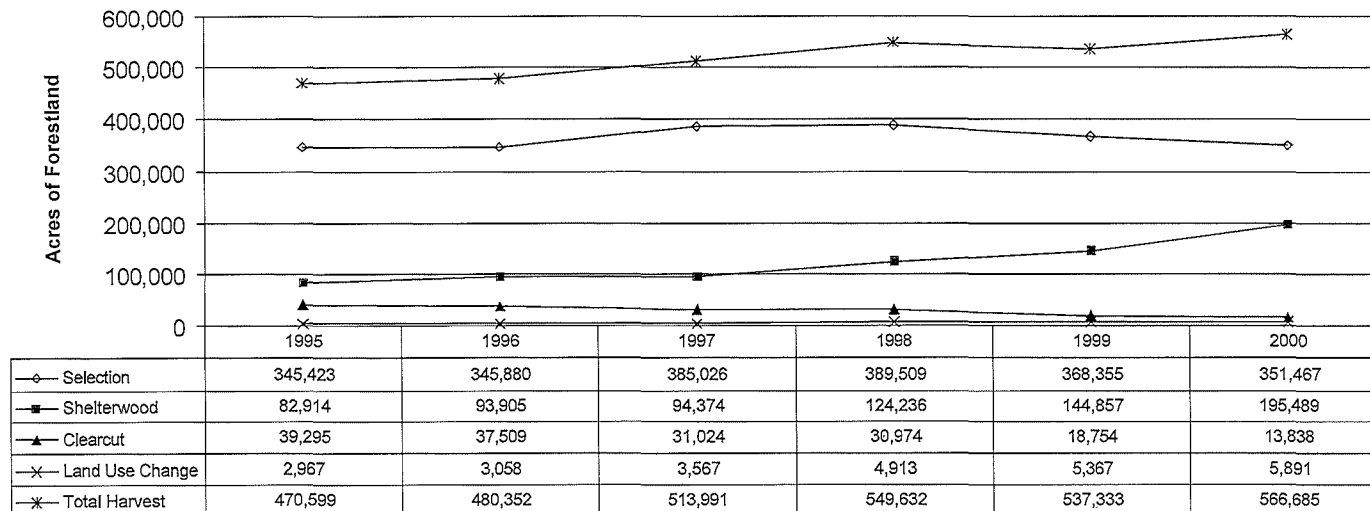
**Ownership Type** *Forest Industry Land:* Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.  
*Institutional Investor Timberlands:* Woodlands owned by organizations that hold assets as fiduciaries for the benefit of others.  
*Non-Industrial Land:* Woodlands privately owned but NOT by a forest industry. These include private individuals and other non-forest product industries.

*Other woodlands:* Woodlands owned by a governmental entity -- local, state, federal, or tribal governments.

**Types of Harvests** *Selection:* Harvest method where trees are removed individually or in small (<5 acre) patches.  
*Shelterwood:* Harvest method of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.  
*Clearcut:* Harvest method on a site greater than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Practices Act, Maine Forest Service Rules Ch. 20 for additional information.

*Change of Land Use:* the land use after harvest does not include growing forest products.

### Harvesting Trends 1995-2000



## 2000 Annual Report on Clearcutting

Compiled from the 2000 Landowner Reports and survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRSA § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |    |       |   |           |           | All Other Landowners |         |           |           | All Landowners           |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|----|-------|---|-----------|-----------|----------------------|---------|-----------|-----------|--------------------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |    |       |   |           |           | <u>Acres</u>         |         |           |           |                          |
|              | <u>Acres</u>                          |         | #                            | Acres | <u>Acres</u>                                 |    |       |   |           |           | TSI                  | Planted | Clearcut  |           | <u>Acres</u><br>Clearcut |
|              | TSI                                   | Planted |                              |       | 1                                            | 2  | 3     | 4 | Sub Total | Avg. Size |                      |         | Sub Total | Avg. Size |                          |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 7                    | 6       | 0         | 0         | 0                        |
| Aroostook    | 11,960                                | 4,636   | 0                            | 0     | 4,203                                        | 0  | 149   | 0 | 4,352     | 21        | 856                  | 176     | 209       | 11        | 4,561                    |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 66                   | 0       | 70        | 12        | 70                       |
| Franklin     | 378                                   | 377     | 0                            | 0     | 986                                          | 0  | 0     | 0 | 986       | 31        | 231                  | 9       | 54        | 8         | 1,040                    |
| Hancock      | 980                                   | 645     | 0                            | 0     | 472                                          | 0  | 0     | 0 | 472       | 39        | 251                  | 35      | 105       | 18        | 577                      |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 111                  | 3       | 41        | 10        | 41                       |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 0                    | 5       | 45        | 11        | 45                       |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 133                  | 4       | 81        | 9         | 81                       |
| Oxford       | 0                                     | 716     | 0                            | 0     | 1,303                                        | 0  | 126   | 0 | 1,429     | 19        | 594                  | 105     | 89        | 7         | 1,518                    |
| Penobscot    | 728                                   | 863     | 2                            | 174   | 1,021                                        | 0  | 0     | 0 | 1,021     | 24        | 355                  | 31      | 154       | 12        | 1,175                    |
| Piscataquis  | 4,434                                 | 1,695   | 0                            | 0     | 578                                          | 12 | 153   | 0 | 743       | 26        | 123                  | 140     | 55        | 9         | 798                      |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 0                    | 0       | 0         | 0         | 0                        |
| Somerset     | 1,646                                 | 1,119   | 0                            | 0     | 1,620                                        | 0  | 684   | 0 | 2,304     | 32        | 202                  | 26      | 747       | 13        | 3,051                    |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 164                  | 59      | 244       | 20        | 244                      |
| Washington   | 1,176                                 | 688     | 0                            | 0     | 469                                          | 0  | 5     | 0 | 474       | 34        | 121                  | 0       | 148       | 11        | 622                      |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 74                   | 5       | 15        | 8         | 15                       |
| State Total: | 21,302                                | 10,739  | 2                            | 174   | 10,652                                       | 12 | 1,117 | 0 | 11,781    | 24        | 3,288                | 602     | 2,057     | 12        | 13,838                   |

### Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

### Frequency Distribution of Clearcutting for Large Landowners who own more than 100,000 acres

2000 Clearcut as  
percent of statewide  
ownership

# of Landowners

Clearcut Acres

0% - 0.001%

13

0

0.001%-0.25%

10

5,587

0.26%-0.75%

2

6,194

0.76%-1.00%

0

0

# 2001

## Silvicultural Activities

### including Annual Report on Clearcutting

Compiled from the 2001 Landowner Reports and other survey instruments.  
Data collected under the provisions of Title 12 MRSA §8885 and §8878-A

Published:  
September 26, 2002



DEPARTMENT OF CONSERVATION  
MAINE FOREST SERVICE  
FOREST POLICY AND MANAGEMENT DIVISION  
#22 STATE HOUSE STATION  
AUGUSTA, ME 04333  
(207)287-2791 OR 1-800-367-0223(instate)  
[www.maineforestservice.org](http://www.maineforestservice.org)

We help you make informed decisions about Maine's forests.

printed under appropriation 010-04A-5400-552

## Report Highlights

### Timber Harvesting

- The total area harvested in 2001 was 565,789 acres, a slight decrease from 569,470 acres in 2000.
- The total area partially harvested in 2001 was 546,157 acres, a slight decrease from 550,243 acres in 2000.

#### Clearcutting:

1. The total area clearcut increased slightly, from 13,185 acres in 2000 to 15,077 acres in 2001.  
Clearcutting still amounts to less than 3% of total harvested acres and remains well below the levels of the 1990's.
2. Landowners owning more than 100,000 acres in Maine created 89% of all clearcuts (13,390 acres). No clearcuts were larger than 75 acres. The highest rate of clearcutting for an individual landowner was 0.6% of total statewide ownership.
3. The average size clearcut in 2001 was 21 acres statewide. Landowners owning more than 100,000 acres had an average clearcut size of 24 acres. Landowners owning less than 100,000 acres had an average clearcut size of 12 acres.
4. The dominant silvicultural reason for clearcutting, reported by the large landowners, was for areas where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other primary land use decreased 25% from 6,042 acres in 2000 to 4,556 acres in 2001.
- Due to a change in state law that exempts small harvests (<5 acres) from reporting requirements, acres of land use change reported here most likely underestimate the actual number.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation decreased 33%, from 962 acres in 2000 to 645 acres in 2001.
- To release crop trees from competing vegetation decreased 53%, from 24,091 acres in 2000 to 11,370 acres in 2001.

#### Timber Stand Improvement (TSI):

- Precommercial Thinning of young stands with spacing saws decreased 11%, from 24,590 acres in 2000 to 21,893 acres in 2001.  
87% of this activity was done by landowners owning more than 100,000 acres.

#### Planting:

- Tree planting decreased 4%, from 11,341 acres in 2000 to 10,885 acres in 2001.  
96% of the planting was by landowners owning more than 100,000 acres. The predominant species planted were spruces.

### Professional Assistance

- The harvest acres supervised by licensed foresters remained consistent.  
74% of all harvest acres in 2001 had a licensed forester involved, compared to 75% of all harvests in 2000.

#### \*Footnotes:

The revised Maine Forest Service Rules - Chapter 20: Forest Regeneration and Clearcutting Standards that took effect in October 1999 require 60 days preharvest notification and on-site review by Maine Forest Service staff for any clearcut proposed to exceed 75 acres.



## 2001 Harvesting and Land Use Changes

| Commercial Harvest Information by Landowner Size and Type |                        | Acres     |                               |             |                       |          |                 |
|-----------------------------------------------------------|------------------------|-----------|-------------------------------|-------------|-----------------------|----------|-----------------|
|                                                           |                        | Selection | Shelterwood                   |             |                       | Clearcut | Land Use Change |
|                                                           |                        |           | Initial or Intermediate Entry | Final Entry | Sub-Total Shelterwood |          |                 |
| Ownership Type                                            | Ownership Size         |           |                               |             |                       |          | Total Harvest   |
| Forest Industry Land                                      | 1 to 100 acres         | 0         | 0                             | 0           | 0                     | 11       | 11              |
|                                                           | 101 to 1,000 acres     | 1,141     | 60                            | 0           | 60                    | 0        | 1,203           |
|                                                           | 1,001 to 100,000 acres | 1,904     | 1,313                         | 92          | 1,405                 | 230      | 3,593           |
|                                                           | 100,000 + acres        | 59,256    | 44,731                        | 36,694      | 81,425                | 12,075   | 152,791         |
|                                                           | SubTotal               | 62,301    | 46,104                        | 36,786      | 82,890                | 12,316   | 157,598         |
| Institutional Investor Timberlands                        | 1 to 100 acres         | 0         | 0                             | 0           | 0                     | 0        | 0               |
|                                                           | 101 to 1,000 acres     | 0         | 0                             | 0           | 0                     | 0        | 0               |
|                                                           | 1,001 to 100,000 acres | 2,622     | 343                           | 0           | 343                   | 20       | 2,985           |
|                                                           | 100,000 + acres        | 21,721    | 25,928                        | 6,258       | 32,186                | 281      | 54,189          |
|                                                           | SubTotal               | 24,343    | 26,271                        | 6,258       | 32,529                | 301      | 57,174          |
| Non-Industrial Land                                       | 1 to 100 acres         | 56,634    | 1,528                         | 959         | 2,487                 | 349      | 61,682          |
|                                                           | 101 to 1,000 acres     | 81,552    | 2,770                         | 1,856       | 4,626                 | 349      | 88,430          |
|                                                           | 1,001 to 100,000 acres | 77,002    | 5,577                         | 18,540      | 24,117                | 685      | 102,015         |
|                                                           | 100,000 + acres        | 35,074    | 37,545                        | 10,658      | 48,203                | 1,034    | 84,324          |
|                                                           | SubTotal               | 250,262   | 47,420                        | 32,013      | 79,433                | 2,417    | 336,451         |
| Other woodlands (Govt, etc.)                              | 1 to 100 acres         | 589       | 25                            | 10          | 35                    | 0        | 686             |
|                                                           | 101 to 1,000 acres     | 1,702     | 83                            | 11          | 94                    | 24       | 1,855           |
|                                                           | 1,001 to 100,000 acres | 3,314     | 457                           | 242         | 699                   | 18       | 4,059           |
|                                                           | 100,000 + acres        | 6,854     | 503                           | 609         | 1,112                 | 0        | 7,966           |
|                                                           | SubTotal               | 12,459    | 1,068                         | 872         | 1,940                 | 42       | 14,566          |
| 2001 Totals:                                              |                        | 349,365   | 120,863                       | 75,929      | 196,792               | 15,077   | 565,789         |
| Percent of 2001 Harvest:                                  |                        | 61.75%    | 21.36%                        | 13.42%      | 34.78%                | 2.66%    | 100.00%         |
| 2000 Totals:                                              |                        | 353,230   |                               |             | 197,013               | 13,185   | 569,470         |
| Percent Change from 2000 to 2001:                         |                        | -1%       |                               |             | 0%                    | 14%      | -1%             |

The 2000 totals in this report may not match those published in the May 25, 2001 report due to receipt of additional data or corrections

## 2001 Precommercial Activities and Professional Assistance

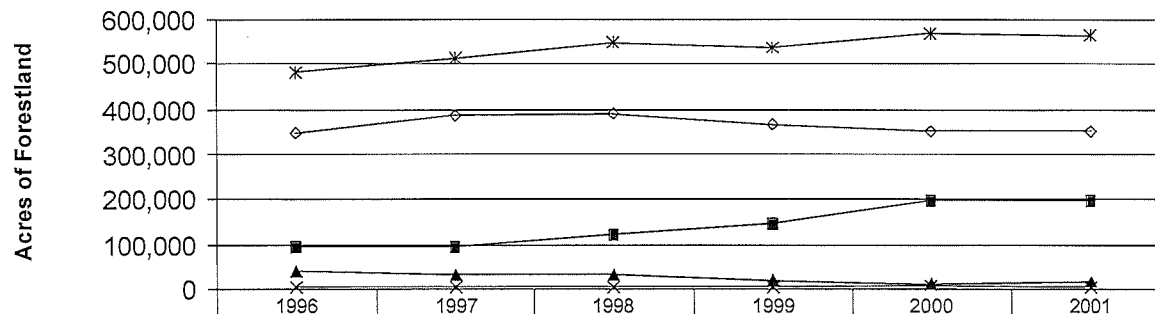
| OwnershipTypeOwnership Size        |                        | Precommercial Activities<br>by Landowner Size and Type |        |        |                  | Number of<br>Reported<br>Harvests | Licensed Professional<br>Forester Use<br>by Landowner Size and Type |                |
|------------------------------------|------------------------|--------------------------------------------------------|--------|--------|------------------|-----------------------------------|---------------------------------------------------------------------|----------------|
|                                    |                        | Acres                                                  |        |        |                  |                                   | Number of<br>Harvests                                               | Total<br>Acres |
|                                    |                        | Herbicide Use                                          |        | TSI    | Tree<br>Planting |                                   |                                                                     |                |
| Site Prep                          | Release                |                                                        |        |        |                  |                                   |                                                                     |                |
| Forest Industry Land               | 1 to 100 acres         | 0                                                      | 0      | 0      | 0                | 1                                 | 0                                                                   | 0              |
|                                    | 101 to 1,000 acres     | 0                                                      | 0      | 0      | 0                | 6                                 | 3                                                                   | 640            |
|                                    | 1,001 to 100,000 acres | 10                                                     | 18     | 0      | 18               | 37                                | 32                                                                  | 2,861          |
|                                    | 100,000 + acres        | 370                                                    | 10,360 | 18,026 | 9,047            | 303                               | 281                                                                 | 138,618        |
|                                    | Subtotal               | 380                                                    | 10,378 | 18,026 | 9,065            | 347                               | 316                                                                 | 142,119        |
| Institutional Investor Timberlands | 1 to 100 acres         | 0                                                      | 0      | 0      | 0                | 0                                 | 0                                                                   | 0              |
|                                    | 101 to 1,000 acres     | 0                                                      | 0      | 0      | 0                | 0                                 | 0                                                                   | 0              |
|                                    | 1,001 to 100,000 acres | 0                                                      | 0      | 0      | 0                | 26                                | 23                                                                  | 2,425          |
|                                    | 100,000 + acres        | 0                                                      | 0      | 0      | 0                | 62                                | 56                                                                  | 49,542         |
|                                    | Subtotal               | 0                                                      | 0      | 0      | 0                | 88                                | 79                                                                  | 51,967         |
| Non-Industrial Land                | 1 to 100 acres         | 20                                                     | 10     | 1,364  | 49               | 2,659                             | 807                                                                 | 20,440         |
|                                    | 101 to 1,000 acres     | 6                                                      | 10     | 1,519  | 266              | 1,729                             | 719                                                                 | 37,527         |
|                                    | 1,001 to 100,000 acres | 224                                                    | 0      | 42     | 89               | 444                               | 317                                                                 | 79,097         |
|                                    | 100,000 + acres        | 15                                                     | 822    | 783    | 1,414            | 191                               | 171                                                                 | 74,958         |
|                                    | Subtotal               | 265                                                    | 842    | 3,708  | 1,818            | 5,023                             | 2,014                                                               | 212,022        |
| Other woodlands (Govt, etc.)       | 1 to 100 acres         | 0                                                      | 0      | 0      | 0                | 20                                | 5                                                                   | 134            |
|                                    | 101 to 1,000 acres     | 0                                                      | 50     | 7      | 0                | 36                                | 32                                                                  | 1,817          |
|                                    | 1,001 to 100,000 acres | 0                                                      | 100    | 150    | 2                | 40                                | 36                                                                  | 3,953          |
|                                    | 100,000 + acres        | 0                                                      | 0      | 2      | 0                | 30                                | 30                                                                  | 7,966          |
|                                    | Subtotal               | 0                                                      | 150    | 159    | 2                | 126                               | 103                                                                 | 13,870         |
| 2001 Totals:                       |                        | 645                                                    | 11,370 | 21,893 | 10,885           | 5,584                             | 2,512                                                               | 419,977        |
| 2000 Totals:                       |                        | 962                                                    | 24,091 | 24,590 | 11,341           | 6,352                             | 2,670                                                               | 427,622        |
| Change from 2000 to 2001:          |                        | -33%                                                   | -53%   | -11%   | -4%              | -12%                              | -6%                                                                 | -2%            |

The 2000 totals in this report may not match those published in the May 25, 2001 report due to receipt of additional data or corrections

**Definitions:**

- Ownership Type**
- Forest Industry Land:** Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.
- Institutional Investor Timberlands:** Woodlands owned by organizations that hold assets as fiduciaries for the benefit of others.
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- Types of Harvests**
- Selection:** Harvest method where trees are removed individually or in small (<5 acre) patches.
- Shelterwood:** Harvest method of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.
- Clearcut:** Harvest method on a site greater than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Practices Act, Maine Forest Service Rules Chapter 20 for additional information.
- Change of Land Use:** Harvest conducted to convert forestland to another land use such as houselots, farm pastures, etc.

### Harvesting Trends in Maine 1996-2001



|                   |         |         |         |         |         |         |
|-------------------|---------|---------|---------|---------|---------|---------|
| ◆ Selection       | 345,880 | 385,026 | 389,509 | 368,355 | 353,230 | 349,365 |
| ■ Shelterwood     | 93,905  | 94,374  | 124,236 | 144,857 | 197,013 | 196,792 |
| ▲ Clearcut        | 37,509  | 31,024  | 30,974  | 18,754  | 13,185  | 15,077  |
| × Land Use Change | 3,058   | 3,567   | 4,913   | 5,367   | 6,042   | 4,556   |
| * Total Harvest   | 480,352 | 513,991 | 549,632 | 537,333 | 569,470 | 565,789 |

## 2001 Annual Report on Clearcutting

Compiled from the 2001 Landowner Reports and survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRSA § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |   |       |    |           |           | All Other Landowners |         |           |           | All Landowners |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|---|-------|----|-----------|-----------|----------------------|---------|-----------|-----------|----------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |   |       |    |           |           | Acres                |         |           |           |                |
|              |                                       |         |                              |       |                                              |   |       |    |           |           |                      |         |           |           |                |
|              | Acres                                 |         | Acres                        |       |                                              |   |       |    | Clearcut  |           |                      |         | Acres     |           |                |
|              | TSI                                   | Planted | #                            | Acres | 1                                            | 2 | 3     | 4  | Sub Total | Avg. Size | TSI                  | Planted | Sub Total | Avg. Size | Clearcut       |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 83                   | 2       | 46        | 15        | 46             |
| Aroostook    | 11,406                                | 4,091   | 0                            | 0     | 4,154                                        | 0 | 1,272 | 0  | 5,426     | 20        | 361                  | 149     | 335       | 15        | 5,761          |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 90                   | 2       | 0         | 0         | 0              |
| Franklin     | 989                                   | 447     | 0                            | 0     | 1,071                                        | 0 | 259   | 0  | 1,330     | 28        | 231                  | 2       | 22        | 7         | 1,352          |
| Hancock      | 1,126                                 | 708     | 0                            | 0     | 424                                          | 0 | 0     | 0  | 424       | 53        | 149                  | 9       | 91        | 15        | 515            |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 42                   | 9       | 64        | 16        | 64             |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 192                  | 11      | 0         | 0         | 0              |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 137                  | 2       | 5         | 5         | 5              |
| Oxford       | 428                                   | 678     | 0                            | 0     | 1,817                                        | 0 | 129   | 0  | 1,946     | 28        | 482                  | 77      | 95        | 10        | 2,041          |
| Penobscot    | 1,857                                 | 1,238   | 0                            | 0     | 1,586                                        | 0 | 241   | 0  | 1,827     | 31        | 251                  | 75      | 436       | 17        | 2,263          |
| Piscataquis  | 1,196                                 | 731     | 0                            | 0     | 442                                          | 0 | 70    | 11 | 523       | 25        | 157                  | 13      | 60        | 15        | 583            |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 22                   | 0       | 0         | 0         | 0              |
| Somerset     | 685                                   | 1,884   | 0                            | 0     | 887                                          | 0 | 588   | 0  | 1,475     | 24        | 311                  | 44      | 366       | 17        | 1,841          |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 148                  | 27      | 64        | 8         | 64             |
| Washington   | 1,124                                 | 684     | 0                            | 0     | 304                                          | 0 | 135   | 0  | 439       | 29        | 94                   | 3       | 70        | 9         | 509            |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 332                  | 0       | 32        | 11        | 32             |
| State Total: | 18,811                                | 10,461  | 0                            | 0     | 10,685                                       | 0 | 2,694 | 11 | 13,390    | 24        | 3,082                | 424     | 1,686     | 12        | 15,076         |

### Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

### Frequency Distribution of Clearcutting for Large Landowners who own more than 100,000 acres

#### 2001 Clearcut as percent of statewide ownership

0% - 0.001%  
0.001%-0.25%  
0.26%-0.75%  
0.76%-1.00%

#### # of Landowners

18  
5  
3  
0

#### Clearcut Acres

438  
1,713  
11,239  
0

## Maine Forest Service District Foresters

The Maine Forest Service has 10 District Foresters who provide technical assistance and educational services to landowners, loggers, schools and educational institutions, municipalities and other stakeholders. Field Foresters conduct educational workshops, field demonstrations, media presentations, and can provide limited one-on-one contact with individual landowners.

### Dennis Brennan

2281 Alfred Road  
Lyman, ME 04002  
Phone: (207)324-7000  
E-mail: dennis.brennan@state.me.us

### Patty Cormier

536 Waldoboro Road  
Jefferson, ME 04348  
Phone: (207)549-9003  
E-mail: patty.cormier@state.me.us

### Geneva Duncan-Frost

P.O. Box 130  
Jonesboro, ME 04468  
Phone: (207) 434-2622  
E-mail: geneva.duncan@state.me.us

### Jim Ecker

P.O. Box 415  
Old Town, ME 04468  
Phone: (207) 827-1811  
E-mail: jim.ecker@state.me.us

### Dan Jacobs

2 Forestry Road  
Island Falls, ME 04747  
Phone: (207) 463-3653  
E-mail: dan.jacobs@state.me.us

### Paul Larrivee, Jr

356 Shaker Road  
Gray, ME 04039  
Phone: (207) 657-3535  
E-mail: paul.larrivee@state.me.us

### Bob Leso

564 Skowhegan Road  
Norridgewock, ME 04957  
Phone: (207) 474-3499  
E-mail: bob.leso@state.me.us

### Gordon Moore

P.O. Box 1107  
Greenville, ME 04441  
Phone: (207) 695-3721  
E-mail: gordon.moore@state.me.us

### Merle Ring

131 Bethel Road  
West Paris, ME 04289  
Phone: (207) 674-3787  
E-mail: merle.ring@state.me.us

### Dave Rochester

45 Radar Road  
Ashland, ME 04732  
Phone: (207) 435-7963  
E-mail: dave.rochester@state.me.us



# 2002

## Silvicultural Activities Report

including Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2002 Landowner Reports and other survey instruments.  
Data collected under the provisions of Title 12 MRSA §8885 and §8878-A

Published:

July 9, 2003

UPDATED: November 18, 2003



DEPARTMENT OF CONSERVATION  
MAINE FOREST SERVICE  
FOREST POLICY AND MANAGEMENT DIVISION  
#22 STATE HOUSE STATION  
AUGUSTA, ME 04333  
(207)287-2791 OR 1-800-367-0223(instate)  
[www.maineforestservice.org](http://www.maineforestservice.org)

We help you make informed decisions about Maine's forest

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## Report Highlights

### Harvesting and Land Use Changes

- The total area harvested in 2002 was 562,424 acres, a slight decrease from 565,312 acres in 2001.
- The total area partially harvested in 2002 was 538,909 acres, a slight decrease from 546,386 acres in 2001.

#### Clearcutting:

1. The total area clearcut increased, from 14,391 acres in 2001 to 18,388 acres in 2002.  
Clearcutting amounts to less than 5% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 92% of all clearcuts (16,888 acres). The highest rate of clearcutting for an individual landowner, in this ownership size, was 0.8% of its total statewide ownership.
3. The average size clearcut in 2002 was 22 acres statewide. Landowners owning more than 100,000 acres had an average clearcut size of 24 acres. Landowners owning less than 100,000 acres had an average clearcut size of 12 acres. There was one clearcut created in 2002 that was over 75 acres in size.
4. The primary silvicultural reason for clearcutting reported by large landowners was for areas where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other primary land use increased 11% from 4,535 acres in 2001 to 5,126 acres in 2002.
- Due to a change in state law that exempts small harvests (<5 acres) from reporting requirements, acres of land use change reported here most likely underestimate the actual number.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation increased 298%, from 421 acres in 2001 to 1,674 acres in 2002.  
This is a normal periodic increase of intensive management by large landowners for the purpose of establishing new forest stands.
- To release crop trees from competing vegetation increased 38%, from 11,370 acres in 2001 to 16,732 acres in 2002.

#### Timber Stand Improvement (TSI):

- Precommercial Thinning of young stands with spacing saws decreased 21%, from 21,862 acres in 2001 to 19,071 acres in 2002.  
92% of this activity was done by landowners owning more than 100,000 acres.

#### Planting:

- Tree planting decreased 37%, from 10,885 acres in 2001 to 7,926 acres in 2002.  
97% of the planting was by landowners owning more than 100,000 acres. The predominant species planted were spruces.

### Professional Assistance

- The harvest acres supervised by licensed foresters remained consistent.  
76% of all harvest acres in 2002 had a licensed forester involved, compared to 74% of all harvests in 2001.
- Licensed Forester supervision on small woodlots (<= 100 acres) declined from 33% in 2001 to 24% in 2002.

## 2002 Harvesting and Land Use Changes

| Commercial Harvest Information by Landowner Size and Type |                        | Acres     |                               |             |          |                 |               |
|-----------------------------------------------------------|------------------------|-----------|-------------------------------|-------------|----------|-----------------|---------------|
|                                                           |                        | Selection | Shelterwood                   |             | Clearcut | Land Use Change | Total Harvest |
| OwnershipType                                             | Ownership Size         |           | Initial or Intermediate Entry | Final Entry |          |                 |               |
| Forest Industry Land                                      | 1 to 100 acres         | 77        | 0                             | 0           | 0        | 0               | 77            |
|                                                           | 101 to 1,000 acres     | 150       | 0                             | 0           | 0        | 0               | 150           |
|                                                           | 1,001 to 100,000 acres | 5,140     | 876                           | 0           | 876      | 32              | 6,050         |
|                                                           | 100,000 + acres        | 58,430    | 48,730                        | 35,661      | 84,391   | 13,580          | 156,578       |
|                                                           | SubTotal               | 63,797    | 49,606                        | 35,661      | 85,267   | 13,612          | 162,855       |
| Institutional Investor Timberlands                        | 1 to 100 acres         | 0         | 0                             | 0           | 0        | 0               | 0             |
|                                                           | 101 to 1,000 acres     | 0         | 0                             | 0           | 0        | 0               | 0             |
|                                                           | 1,001 to 100,000 acres | 517       | 1,220                         | 229         | 1,449    | 0               | 1,966         |
|                                                           | 100,000 + acres        | 17,373    | 23,810                        | 11,297      | 35,107   | 538             | 53,018        |
|                                                           | SubTotal               | 17,890    | 25,030                        | 11,526      | 36,556   | 538             | 54,984        |
| Non-Industrial Land                                       | 1 to 100 acres         | 51,399    | 1,048                         | 894         | 1,942    | 278             | 55,972        |
|                                                           | 101 to 1,000 acres     | 66,257    | 1,621                         | 2,840       | 4,461    | 258             | 72,353        |
|                                                           | 1,001 to 100,000 acres | 106,579   | 11,950                        | 18,189      | 30,139   | 964             | 138,686       |
|                                                           | 100,000 + acres        | 19,558    | 32,720                        | 9,429       | 42,149   | 2,673           | 64,380        |
|                                                           | SubTotal               | 243,793   | 47,339                        | 31,352      | 78,691   | 4,173           | 331,391       |
| Other woodlands (Govt, etc.)                              | 1 to 100 acres         | 226       | 60                            | 0           | 60       | 67              | 353           |
|                                                           | 101 to 1,000 acres     | 1,351     | 150                           | 25          | 175      | 81              | 1,607         |
|                                                           | 1,001 to 100,000 acres | 2,710     | 372                           | 131         | 503      | 50              | 3,329         |
|                                                           | 100,000 + acres        | 6,539     | 929                           | 422         | 1,351    | 15              | 7,905         |
|                                                           | SubTotal               | 10,826    | 1,511                         | 578         | 2,089    | 213             | 13,194        |
| 2002 Totals:                                              |                        | 336,306   | 123,486                       | 79,117      | 202,603  | 18,389          | 562,424       |
| Percent of 2002 Harvest:                                  |                        | 59.80%    | 21.96%                        | 14.07%      | 36.02%   | 3.27%           | 100.00%       |
| 2001 Totals:                                              |                        | 349,594   | 120,863                       | 75,929      | 196,792  | 14,391          | 565,312       |
| Percent Change from 2001 to 2002:                         |                        | -4%       | 2%                            | 4%          | 3%       | 28%             | -1%           |

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## 2002 Precommercial Activities and Professional Assistance

| OwnershipTypeOwnership Size        |                        | Precommercial Activities<br>by Landowner Size and Type |        |        |                  | Number of<br>Reported<br>Harvests | Licensed Professional<br>Forester Use<br>by Landowner Size and Type |                |
|------------------------------------|------------------------|--------------------------------------------------------|--------|--------|------------------|-----------------------------------|---------------------------------------------------------------------|----------------|
|                                    |                        | Acres                                                  |        |        |                  |                                   | Number of<br>Harvests                                               | Total<br>Acres |
|                                    |                        | Herbicide Use                                          |        | TSI    | Tree<br>Planting |                                   |                                                                     |                |
| Site Prep                          | Release                |                                                        |        |        |                  |                                   |                                                                     |                |
| Forest Industry Land               | 1 to 100 acres         | 0                                                      | 0      | 0      | 0                | 3                                 | 0                                                                   | 0              |
|                                    | 101 to 1,000 acres     | 0                                                      | 0      | 0      | 0                | 3                                 | 0                                                                   | 0              |
|                                    | 1,001 to 100,000 acres | 82                                                     | 0      | 0      | 37               | 18                                | 18                                                                  | 6,020          |
|                                    | 100,000 + acres        | 1,067                                                  | 11,397 | 15,877 | 7,143            | 323                               | 306                                                                 | 144,890        |
|                                    | Subtotal               | 1,149                                                  | 11,397 | 15,877 | 7,180            | 347                               | 324                                                                 | 150,910        |
| Institutional Investor Timberlands | 1 to 100 acres         | 0                                                      | 0      | 0      | 0                | 0                                 | 0                                                                   | 0              |
|                                    | 101 to 1,000 acres     | 0                                                      | 0      | 0      | 0                | 0                                 | 0                                                                   | 0              |
|                                    | 1,001 to 100,000 acres | 0                                                      | 0      | 0      | 0                | 18                                | 17                                                                  | 1,713          |
|                                    | 100,000 + acres        | 0                                                      | 0      | 0      | 0                | 51                                | 48                                                                  | 51,122         |
|                                    | Subtotal               | 0                                                      | 0      | 0      | 0                | 69                                | 65                                                                  | 52,835         |
| Non-Industrial Land                | 1 to 100 acres         | 6                                                      | 5      | 344    | 50               | 2,418                             | 516                                                                 | 13,539         |
|                                    | 101 to 1,000 acres     | 10                                                     | 8      | 329    | 53               | 1,513                             | 503                                                                 | 28,208         |
|                                    | 1,001 to 100,000 acres | 230                                                    | 647    | 641    | 76               | 470                               | 313                                                                 | 112,662        |
|                                    | 100,000 + acres        | 279                                                    | 4,645  | 1,867  | 555              | 173                               | 157                                                                 | 55,935         |
|                                    | Subtotal               | 525                                                    | 5,305  | 3,181  | 734              | 4,574                             | 1,489                                                               | 210,344        |
| Other woodlands (Govt, etc.)       | 1 to 100 acres         | 0                                                      | 0      | 2      | 2                | 18                                | 8                                                                   | 142            |
|                                    | 101 to 1,000 acres     | 0                                                      | 30     | 11     | 9                | 35                                | 26                                                                  | 1,449          |
|                                    | 1,001 to 100,000 acres | 0                                                      | 0      | 0      | 1                | 46                                | 34                                                                  | 2,998          |
|                                    | 100,000 + acres        | 0                                                      | 0      | 0      | 0                | 32                                | 32                                                                  | 7,905          |
|                                    | Subtotal               | 0                                                      | 30     | 13     | 12               | 131                               | 100                                                                 | 12,494         |
| 2002 Totals:                       |                        | 1,674                                                  | 16,732 | 19,071 | 7,926            | 5,121                             | 1,978                                                               | 426,583        |
| 2001 Totals:                       |                        | 421                                                    | 11,370 | 21,862 | 10,885           | 5,591                             | 2,504                                                               | 419,384        |
| Change from 2001 to 2002:          |                        | 298%                                                   | 47%    | -13%   | -27%             | -8%                               | -21%                                                                | 2%             |

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**Definitions:**

**Ownership Type**

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**Types of Harvests**

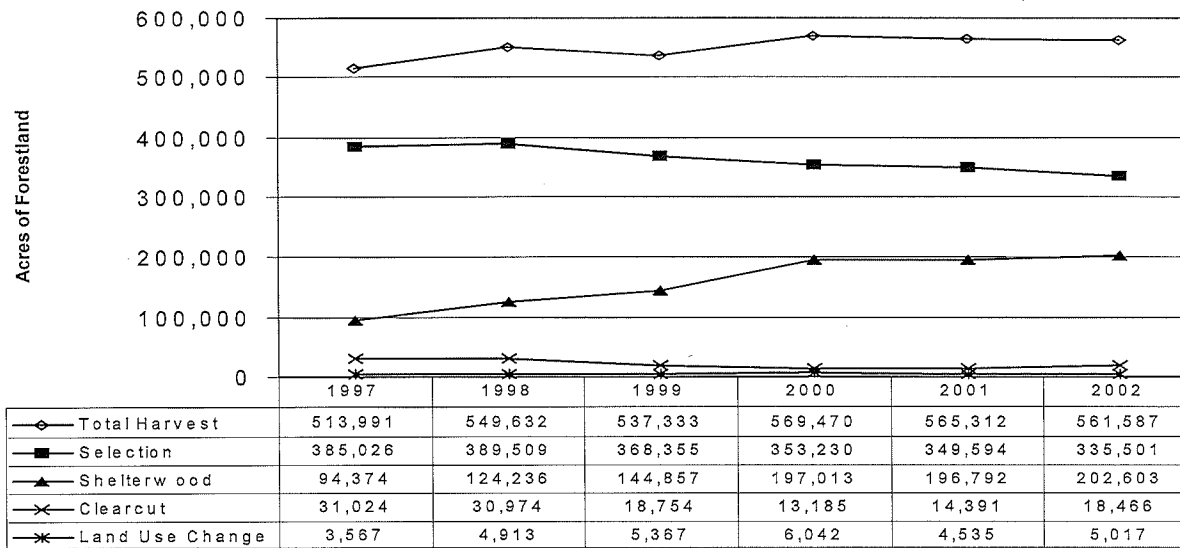
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**Change of Land Use:** Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.

### Harvesting Trends in Maine 1997-2002





## 2002 Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2002 Landowner Reports and survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRSA § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |   |       |    |           |           | All Other Landowners |         |           |           | All Landowners |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|---|-------|----|-----------|-----------|----------------------|---------|-----------|-----------|----------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |   |       |    |           |           |                      |         |           |           |                |
|              | Acres                                 |         | #                            | Acres | Acres                                        |   |       |    |           |           | Acres                |         |           |           | Acres Clearcut |
|              | TSI                                   | Planted |                              |       | 1                                            | 2 | 3     | 4  | Sub Total | Avg. Size | TSI                  | Planted | Sub Total | Avg. Size |                |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 70                   | 10      | 11        | 4         | 11             |
| Aroostook    | 6,906                                 | 3,381   | 0                            | 0     | 5,205                                        | 0 | 1,543 | 0  | 6,748     | 20        | 128                  | 56      | 51        | 10        | 6,799          |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 40                   | 0       | 6         | 6         | 6              |
| Franklin     | 311                                   | 379     | 0                            | 0     | 1,663                                        | 0 | 221   | 0  | 1,884     | 31        | 23                   | 6       | 186       | 13        | 2,070          |
| Hancock      | 499                                   | 514     | 0                            | 0     | 215                                          | 0 | 47    | 0  | 262       | 44        | 45                   | 8       | 126       | 32        | 388            |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 0                    | 0       | 78        | 26        | 78             |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 0                    | 1       | 31        | 5         | 31             |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 1                    | 0       | 18        | 6         | 18             |
| Oxford       | 808                                   | 625     | 0                            | 0     | 2,926                                        | 0 | 76    | 0  | 3,002     | 29        | 36                   | 51      | 20        | 7         | 3,022          |
| Penobscot    | 4,789                                 | 1,198   | 0                            | 0     | 988                                          | 0 | 16    | 0  | 1,004     | 26        | 716                  | 32      | 247       | 15        | 1,251          |
| Piscataquis  | 1,946                                 | 494     | 0                            | 0     | 1,045                                        | 0 | 481   | 0  | 1,526     | 22        | 43                   | 20      | 2         | 2         | 1,528          |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 18                   | 1       | 0         | 0         | 0              |
| Somerset     | 1,678                                 | 853     | 0                            | 0     | 716                                          | 0 | 1,585 | 25 | 2,326     | 18        | 4                    | 1       | 573       | 21        | 2,899          |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 112                  | 38      | 103       | 11        | 103            |
| Washington   | 789                                   | 254     | 0                            | 0     | 136                                          | 0 | 0     | 0  | 136       | 45        | 84                   | 0       | 124       | 8         | 260            |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0  | 0         | 0         | 25                   | 5       | 22        | 7         | 22             |
| State Total: | 17,726                                | 7,698   | 0                            | 0     | 12,894                                       | 0 | 3,969 | 25 | 16,888    | 24        | 1,345                | 229     | 1,598     | 12        | 18,486         |

### Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

### Frequency Distribution of Clearcutting for Large Landowners who own more than 100,000 acres

#### 2002 Clearcut as percent of statewide ownership

|              | <u># of Landowners</u> | <u>Clearcut Acres</u> |
|--------------|------------------------|-----------------------|
| 0% - 0.001%  | 16                     | 321                   |
| 0.001%-0.25% | 7                      | 3,508                 |
| 0.26%-0.75%  | 3                      | 8,988                 |
| 0.76%-1.00%  | 1                      | 4,071                 |

# 2003

## Silvicultural Activities Report

**including Annual Report on Clearcutting and Precommercial Activities**

Compiled from the 2003 Landowner Reports and other survey instruments.  
Data collected under the provisions of Title 12 MRSA §8885 and §8878-A

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Department of Conservation  
Maine Forest Service  
Forest Policy and Management  
#22 SHS, Augusta, ME 04333  
(207)287-2791 OR 1-800-367-0223(instate)  
[www.maineforestservice.org](http://www.maineforestservice.org); [www.bewoodswise.org](http://www.bewoodswise.org)  
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## Report Highlights

### Harvesting and Land Use Changes

- 511,070 acres were harvested in 2003, a 9% decrease from 562,745 acres in 2002. Most of the decline in harvest acreage occurred on non-industrial lands.
- 481,315 acres were partially harvested in 2003, a 11% decrease from 539,225 acres in 2002.
- The number of harvests reported declined 9% from 5,150 to 4,743 harvests.

#### Clearcutting:

1. The total area clearcut increased, from 18,389 acres in 2002 to 24,021 acres in 2003. Clearcutting amounts to less than 5% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 96% of all clearcuts (22,953 acres).
3. Average clearcut size in 2003 was 25 acres. Landowners owning more than 100,000 acres had an average clearcut size of 27 acres. Landowners owning less than 100,000 acres had an average clearcut size of 13 acres. Two clearcuts larger than 75 acres were created in 2003.
4. The primary silvicultural reasons for clearcutting reported by large landowners were: (a) Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality; (b) For areas where the retention of the residual overstory trees were at high risk of windthrow.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use increased 12% from 5,131 acres in 2002 to 5,734 acres in 2003.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation decreased 35%, from 1,690 acres in 2002 to 1,093 acres in 2003.
- To release crop trees from competing vegetation increased 9%, from 17,070 acres in 2002 to 18,663 acres in 2003.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws increased 41%, from 19,089 acres in 2002 to 26,894 acres in 2003.  
98% of this activity was done by landowners owning more than 100,000 acres.

#### Planting:

- Tree planting increased 36%, from 7,926 acres in 2002 to 10,746 acres in 2003.  
84% of the planting was by landowners owning more than 100,000 acres. The predominant species planted were spruce species.

### Professional Assistance

- The harvest acres supervised by licensed foresters declined slightly.  
71% of all harvest acres in 2003 had a licensed forester involved, compared to 76% of all harvests in 2002.  
Licensed Forester supervision on small woodlots ( $\leq 100$  acres) declined slightly from 27% in 2002 to 25% in 2003.

Statewide total harvesting volumes reported in the 2003 Wood processor Report corroborate the data reported in this report that harvesting activities in Maine declined in 2003.

## 2003 Harvesting and Land Use Changes

| Commercial Harvest Information by Landowner Size and Type |                        | Acres            |                               |             |                       |          |                 |               |
|-----------------------------------------------------------|------------------------|------------------|-------------------------------|-------------|-----------------------|----------|-----------------|---------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |             | Sub-Total Shelterwood | Clearcut | Land Use Change | Total Harvest |
| Ownership Type                                            | Ownership Size         |                  | Initial or Intermediate Entry | Final Entry |                       |          |                 |               |
| Forest Industry woodlands                                 | 1 to 100 acres         | 0                | 0                             | 0           | 0                     | 0        | 0               | 0             |
|                                                           | 101 to 1,000 acres     | 135              | 0                             | 0           | 0                     | 0        | 0               | 135           |
|                                                           | 1,001 to 100,000 acres | 3,088            | 2,334                         | 608         | 2,942                 | 209      | 25              | 6,264         |
|                                                           | 100,000 + acres        | 42,496           | 44,784                        | 45,183      | 89,967                | 15,975   | 0               | 148,438       |
|                                                           | SubTotal               | 45,719           | 47,118                        | 45,791      | 92,909                | 16,184   | 25              | 154,837       |
| Institutional Investor Timberlands                        | 1 to 100 acres         | 0                | 0                             | 0           | 0                     | 0        | 0               | 0             |
|                                                           | 101 to 1,000 acres     | 0                | 0                             | 0           | 0                     | 0        | 0               | 0             |
|                                                           | 1,001 to 100,000 acres | 320              | 990                           | 0           | 990                   | 0        | 0               | 1,310         |
|                                                           | 100,000 + acres        | 14,253           | 23,731                        | 14,200      | 37,931                | 1,052    | 0               | 53,236        |
|                                                           | SubTotal               | 14,573           | 24,721                        | 14,200      | 38,921                | 1,052    | 0               | 54,546        |
| Non-Industrial Land                                       | 1 to 100 acres         | 41,260           | 1,934                         | 1,141       | 3,075                 | 193      | 2,019           | 46,547        |
|                                                           | 101 to 1,000 acres     | 58,191           | 2,970                         | 5,553       | 8,523                 | 212      | 2,137           | 69,063        |
|                                                           | 1,001 to 100,000 acres | 75,547           | 10,460                        | 27,176      | 37,636                | 392      | 1,441           | 115,016       |
|                                                           | 100,000 + acres        | 15,496           | 29,132                        | 7,076       | 36,208                | 5,926    | 0               | 57,630        |
|                                                           | SubTotal               | 190,494          | 44,496                        | 40,946      | 85,442                | 6,723    | 5,597           | 288,256       |
| Other woodlands (Govt, etc.)                              | 1 to 100 acres         | 92               | 7                             | 20          | 27                    | 15       | 29              | 163           |
|                                                           | 101 to 1,000 acres     | 1,437            | 95                            | 20          | 115                   | 0        | 49              | 1,601         |
|                                                           | 1,001 to 100,000 acres | 2,747            | 1,430                         | 139         | 1,569                 | 47       | 33              | 4,396         |
|                                                           | 100,000 + acres        | 6,266            | 121                           | 883         | 1,004                 | 0        | 1               | 7,271         |
|                                                           | SubTotal               | 10,542           | 1,653                         | 1,062       | 2,715                 | 62       | 112             | 13,431        |
| 2003 Totals:                                              |                        | 261,328          | 117,988                       | 101,999     | 219,987               | 24,021   | 5,734           | 511,070       |
| Percent of 2003 Harvest:                                  |                        | 51.13%           | 23.09%                        | 19.96%      | 43.04%                | 4.70%    | 1.12%           | 100.00%       |
| 2002 Totals:                                              |                        | 336,622          | 123,486                       | 79,117      | 202,603               | 18,389   | 5,131           | 562,745       |
| Percent Change from 2002 to 2003:                         |                        | -22%             | -4%                           | 29%         | 9%                    | 31%      | 12%             | -9%           |

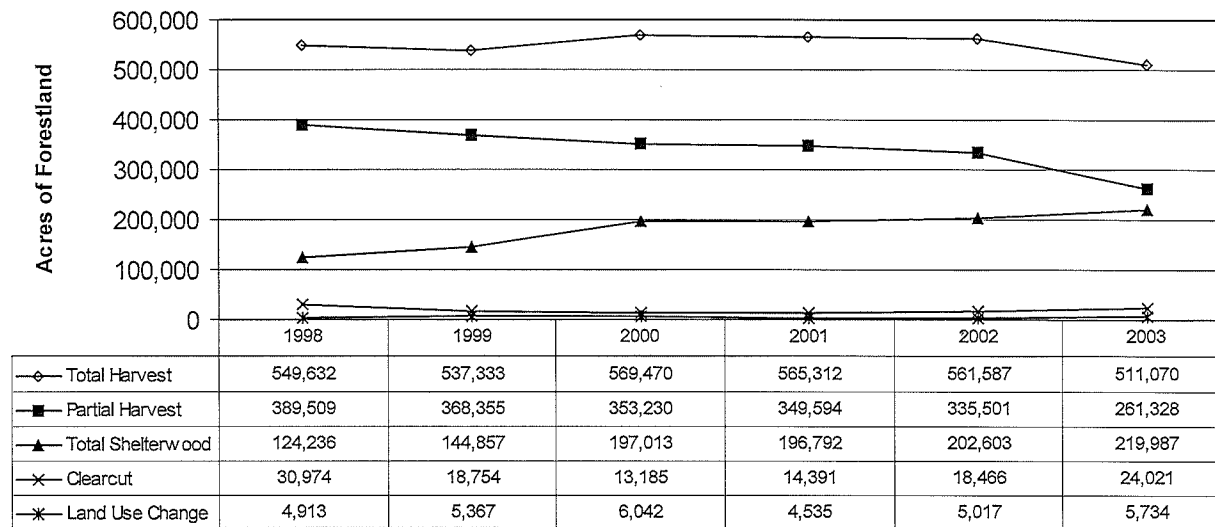
## 2003 Precommercial Activities and Professional Assistance

| OwnershipTypeOwnership Size        |                        | Precommercial Activities<br>by Landowner Size and Type |         |        |                  | Number of<br>Reported<br>Harvests | Licensed Forester<br>Involvement<br>by Landowner Size and Type |                |
|------------------------------------|------------------------|--------------------------------------------------------|---------|--------|------------------|-----------------------------------|----------------------------------------------------------------|----------------|
|                                    |                        | Acres                                                  |         |        |                  |                                   | Number of<br>Harvests                                          | Total<br>Acres |
|                                    |                        | Herbicide Use                                          |         | TSI    | Tree<br>Planting |                                   |                                                                |                |
|                                    |                        | Site Prep                                              | Release |        |                  |                                   |                                                                |                |
| Forest Industry woodlands          | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                | 0                                 | 0                                                              | 0              |
|                                    | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                | 3                                 | 1                                                              | 25             |
|                                    | 1,001 to 100,000 acres | 30                                                     | 0       | 0      | 17               | 41                                | 22                                                             | 3,802          |
|                                    | 100,000 + acres        | 318                                                    | 14,132  | 23,721 | 8,434            | 320                               | 193                                                            | 106,534        |
|                                    | Subtotal               | 348                                                    | 14,132  | 23,721 | 8,451            | 364                               | 216                                                            | 110,361        |
| Institutional Investor Timberlands | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                | 0                                 | 0                                                              | 0              |
|                                    | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                | 0                                 | 0                                                              | 0              |
|                                    | 1,001 to 100,000 acres | 0                                                      | 0       | 0      | 0                | 13                                | 13                                                             | 1,310          |
|                                    | 100,000 + acres        | 0                                                      | 0       | 0      | 0                | 84                                | 80                                                             | 52,153         |
|                                    | Subtotal               | 0                                                      | 0       | 0      | 0                | 97                                | 93                                                             | 53,463         |
| Non-Industrial Land                | 1 to 100 acres         | 10                                                     | 5       | 402    | 1,523            | 2,068                             | 470                                                            | 12,096         |
|                                    | 101 to 1,000 acres     | 111                                                    | 318     | 201    | 83               | 1,412                             | 477                                                            | 27,254         |
|                                    | 1,001 to 100,000 acres | 100                                                    | 100     | 5      | 30               | 545                               | 391                                                            | 88,857         |
|                                    | 100,000 + acres        | 524                                                    | 4,108   | 2,561  | 651              | 148                               | 141                                                            | 55,970         |
|                                    | Subtotal               | 745                                                    | 4,531   | 3,169  | 2,287            | 4,173                             | 1,479                                                          | 184,177        |
| Other woodlands (Govt, etc.)       | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                | 10                                | 4                                                              | 62             |
|                                    | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                | 29                                | 21                                                             | 1,362          |
|                                    | 1,001 to 100,000 acres | 0                                                      | 0       | 4      | 8                | 37                                | 29                                                             | 4,102          |
|                                    | 100,000 + acres        | 0                                                      | 0       | 0      | 0                | 33                                | 33                                                             | 7,271          |
|                                    | Subtotal               | 0                                                      | 0       | 4      | 8                | 109                               | 87                                                             | 12,797         |
| 2003 Totals:                       |                        | 1,093                                                  | 18,663  | 26,894 | 10,746           | 4,743                             | 1,875                                                          | 360,798        |
| 2002 Totals:                       |                        | 1,690                                                  | 17,070  | 19,089 | 7,926            | 5,150                             | 1,950                                                          | 424,325        |
| Change from 2002 to 2003:          |                        | -35%                                                   | 9%      | 41%    | 36%              | -8%                               | -4%                                                            | -15%           |



**Definitions:**

- Ownership Type**
- Forest Industry Land:** Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.
- Institutional Investor Timberlands:** Woodlands owned by organizations that hold assets as fiduciaries for the benefit of others.
- Non-Industrial Land:** Woodlands privately owned but NOT by a forest industry. These include private individuals and other non-forest product industries.
- Other woodlands:** Woodlands owned by other entities not listed above -- including local, state, federal, or tribal governments.
- Types of Harvests**
- Partial Harvest:** Harvest where trees are removed individually or in small (<5 acre) patches.
- Shelterwood:** Harvest of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.
- Clearcut:** Harvest on a site greater than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Practices Act, Maine Forest Service Rules Chapter 20 for additional information.
- Change of Land Use:** Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.

**Harvesting Trends in Maine 1998-2003**

## 2003 Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2003 Landowner Reports and other survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRSA § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |    |        |     |           |           | All Other Landowners |         |           |           | All Landowners           |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|----|--------|-----|-----------|-----------|----------------------|---------|-----------|-----------|--------------------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |    |        |     |           |           | <u>Acres</u>         |         |           |           |                          |
|              | <u>Acres</u>                          |         | #                            | Acres | <u>Acres</u>                                 |    |        |     |           |           | TSI                  | Planted | Clearcut  |           | <u>Acres</u><br>Clearcut |
|              | TSI                                   | Planted |                              |       | 1                                            | 2  | 3      | 4   | Sub Total | Avg. Size |                      |         | Sub Total | Avg. Size |                          |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0      | 0   | 0         | 0         | 88                   | 3       | 17        | 9         | 17                       |
| Aroostook    | 16,352                                | 4,595   | 0                            | 0     | 240                                          | 0  | 7,684  | 0   | 7,924     | 26        | 27                   | 1,507   | 165       | 13        | 8,089                    |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0      | 0   | 0         | 0         | 18                   | 0       | 22        | 7         | 22                       |
| Franklin     | 385                                   | 666     | 0                            | 0     | 2,097                                        | 0  | 235    | 0   | 2,332     | 42        | 21                   | 1       | 127       | 18        | 2,459                    |
| Hancock      | 61                                    | 391     | 0                            | 0     | 381                                          | 22 | 0      | 0   | 403       | 34        | 85                   | 62      | 0         | 0         | 403                      |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0      | 0   | 0         | 0         | 5                    | 2       | 0         | 0         | 0                        |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0      | 0   | 0         | 0         | 50                   | 0       | 0         | 0         | 0                        |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0      | 0   | 0         | 0         | 45                   | 0       | 12        | 12        | 12                       |
| Oxford       | 950                                   | 392     | 2                            | 450   | 3,167                                        | 0  | 129    | 113 | 3,409     | 48        | 40                   | 35      | 10        | 5         | 3,419                    |
| Penobscot    | 3,500                                 | 1,380   | 0                            | 0     | 288                                          | 0  | 854    | 0   | 1,142     | 28        | 27                   | 14      | 137       | 11        | 1,279                    |
| Piscataquis  | 2,861                                 | 706     | 0                            | 0     | 863                                          | 16 | 772    | 0   | 1,651     | 16        | 46                   | 5       | 32        | 16        | 1,683                    |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0      | 0   | 0         | 0         | 0                    | 5       | 15        | 15        | 15                       |
| Somerset     | 1,406                                 | 823     | 0                            | 0     | 3,958                                        | 0  | 1,849  | 0   | 5,807     | 21        | 88                   | 4       | 70        | 9         | 5,877                    |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0      | 0   | 0         | 0         | 40                   | 24      | 316       | 17        | 316                      |
| Washington   | 767                                   | 132     | 0                            | 0     | 148                                          | 0  | 97     | 41  | 286       | 36        | 5                    | 0       | 78        | 9         | 364                      |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0      | 0   | 0         | 0         | 27                   | 0       | 67        | 34        | 67                       |
| State Total: | 26,282                                | 9,085   | 2                            | 450   | 11,142                                       | 38 | 11,620 | 154 | 22,953    | 27        | 612                  | 1,661   | 1,068     | 13        | 24,021                   |

### Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

### Frequency Distribution of Clearcutting

for Large Landowners who own more than 100,000 acres

2003 Clearcut as  
percent of statewide  
ownership

# of Landowners

Clearcut Acres

0% - 0.001%  
0.001%-0.25%  
0.26%-0.75%  
0.76%-1.00%

13  
9  
3  
1

320  
3,498  
14,586  
4,550

# **2004**

## **Silvicultural Activities Report**

### **including Annual Report on Clearcutting and Precommercial Activities**

Compiled from the 2004 Landowner Reports and other survey instruments.  
Data collected under the provisions of Title 12 MRSA §8885 and §8878-A

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**Department of Conservation**  
**Maine Forest Service**  
**Forest Policy and Management**  
**#22 SHS, Augusta, ME 04333**  
**(207)287-2791 OR 1-800-367-0223(instate)**  
**[www.maineforestservice.org](http://www.maineforestservice.org); [www.bewoodswise.org](http://www.bewoodswise.org)**  
***We help you make informed decisions about Maine's forests***  
**This publication is available online at: [www.maineforestservice.org](http://www.maineforestservice.org)**

## Report Highlights

### Harvesting and Land Use Changes

- 507,899 acres were harvested in 2004, a 1% decrease from 511,416 acres in 2003.
- 481,153 acres were partially harvested in 2004, no significant change from 481,661 acres in 2003.
- The number of harvests reported increased 20% from 4,756 to 5,713 harvests.

#### Clearcutting:

1. The total area clearcut decreased, from 24,021 acres in 2003 to 18,779 acres in 2004. Clearcutting amounts to less than 5% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 90% of all clearcuts (16,963 acres).
3. Average clearcut size in 2004 was 20 acres. Landowners owning more than 100,000 acres had an average clearcut size of 27 acres. Landowners owning less than 100,000 acres had an average clearcut size of 13 acres. Three clearcuts larger than 75 acres were created in 2004.
4. The primary silvicultural reasons for clearcutting reported by large landowners were: (a) Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality; and (b) For areas where the retention of the residual overstory trees were at high risk of windthrow.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use increased 39% from 5,734 acres in 2003 to 7,967 acres in 2004.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation decreased 75%, from 1,093 acres in 2003 to 268 acres in 2004.
- To release crop trees from competing vegetation decreased 30%, from 18,663 acres in 2003 to 13,152 acres in 2004.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws decreased 26%, from 26,894 acres in 2003 to 19,871 acres in 2004.
- 95% of this activity was done by landowners owning more than 100,000 acres.

#### Planting:

- Tree planting decreased 30%, from 10,746 acres in 2003 to 7,573 acres in 2004.
- 96% of the planting was by landowners owning more than 100,000 acres. The predominant species planted were mixed softwoods.

### Professional Assistance

- The harvest acres supervised by licensed foresters declined slightly.
- 65% of all harvest acres in 2004 had a licensed forester involved, compared to 70% of all harvests in 2003.
- Licensed Forester supervision on small woodlots ( $\leq 100$  acres) increased slightly from 26% in 2003 to 27% in 2004.

## 2004 Harvesting and Land Use Changes

| Commercial Harvest Information by Landowner Size and Type |                        | Acres            |                               |             |                       |          |                 |               |
|-----------------------------------------------------------|------------------------|------------------|-------------------------------|-------------|-----------------------|----------|-----------------|---------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |             |                       | Clearcut | Land Use Change | Total Harvest |
|                                                           |                        |                  | Initial or Intermediate Entry | Final Entry | Sub-Total Shelterwood |          |                 |               |
| Ownership Type                                            | Ownership Size         |                  |                               |             |                       |          |                 |               |
| Forest Industry woodlands                                 | 1 to 100 acres         | 345              | 2                             | 16          | 18                    | 25       | 141             | 529           |
|                                                           | 101 to 1,000 acres     | 1,561            | 25                            | 8           | 33                    | 0        | 14              | 1,608         |
|                                                           | 1,001 to 100,000 acres | 22,848           | 1,724                         | 4,408       | 6,132                 | 603      | 50              | 29,633        |
|                                                           | 100,000 + acres        | 43,491           | 26,739                        | 35,457      | 62,196                | 7,067    | 0               | 112,754       |
|                                                           | SubTotal               | 68,245           | 28,490                        | 39,889      | 68,379                | 7,695    | 205             | 144,524       |
| Investor Timberlands                                      | 1 to 100 acres         | 18               | 0                             | 0           | 0                     | 0        | 15              | 33            |
|                                                           | 101 to 1,000 acres     | 0                | 0                             | 0           | 0                     | 0        | 20              | 20            |
|                                                           | 1,001 to 100,000 acres | 1,203            | 30                            | 550         | 580                   | 404      | 0               | 2,187         |
|                                                           | 100,000 + acres        | 18,008           | 36,715                        | 22,469      | 59,184                | 9,543    | 0               | 86,735        |
|                                                           | SubTotal               | 19,229           | 36,745                        | 23,019      | 59,764                | 9,947    | 35              | 88,975        |
| Non-Industrial Land                                       | 1 to 100 acres         | 50,987           | 2,652                         | 2,549       | 5,201                 | 211      | 3,137           | 59,536        |
|                                                           | 101 to 1,000 acres     | 69,660           | 4,877                         | 4,474       | 9,351                 | 229      | 2,851           | 82,091        |
|                                                           | 1,001 to 100,000 acres | 65,872           | 5,224                         | 18,283      | 23,507                | 246      | 1,502           | 91,127        |
|                                                           | 100,000 + acres        | 10,144           | 6,454                         | 6,683       | 13,137                | 353      | 10              | 23,644        |
|                                                           | SubTotal               | 196,663          | 19,207                        | 31,989      | 51,196                | 1,039    | 7,500           | 256,398       |
| Other woodlands (Govt, etc.)                              | 1 to 100 acres         | 396              | 40                            | 40          | 80                    | 0        | 166             | 642           |
|                                                           | 101 to 1,000 acres     | 2,529            | 56                            | 131         | 187                   | 5        | 15              | 2,736         |
|                                                           | 1,001 to 100,000 acres | 2,618            | 675                           | 672         | 1,347                 | 93       | 23              | 4,081         |
|                                                           | 100,000 + acres        | 9,253            | 379                           | 888         | 1,267                 | 0        | 23              | 10,543        |
|                                                           | SubTotal               | 14,796           | 1,150                         | 1,731       | 2,881                 | 98       | 227             | 18,002        |
| 2004 Totals:                                              |                        | 298,933          | 85,592                        | 96,628      | 182,220               | 18,779   | 7,967           | 507,899       |
| Percent of 2004 Harvest:                                  |                        | 58.86%           | 16.85%                        | 19.03%      | 35.88%                | 3.70%    | 1.57%           | 100.00%       |
| 2003 Totals:                                              |                        | 261,674          | 117,988                       | 101,999     | 219,987               | 24,021   | 5,734           | 511,416       |
| Percent Change from 2003 to 2004:                         |                        | 14%              | -27%                          | -5%         | -17%                  | -22%     | 39%             | -1%           |



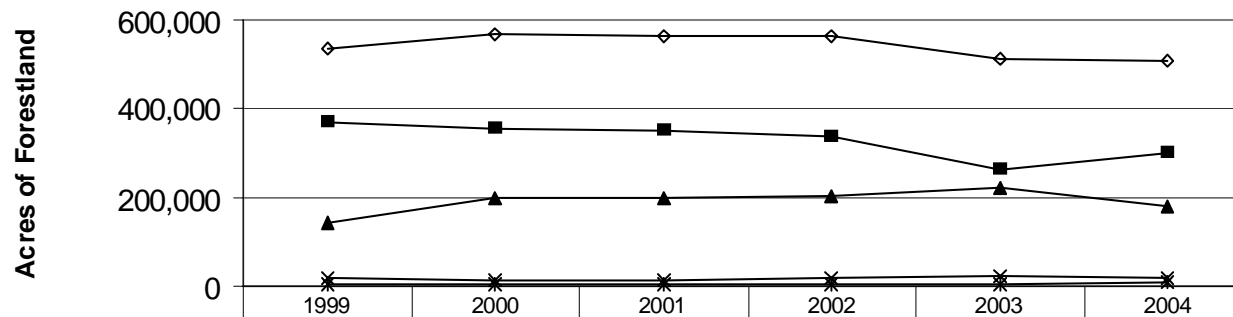
## 2004 Precommercial Activities and Professional Assistance

| OwnershipTypeOwnership Size  |                        | Precommercial Activities<br>by Landowner Size and Type |         |        |                  | Number of<br>Reported<br>Harvests | Licensed Forester<br>Involvement<br>by Landowner Size and Type |                |
|------------------------------|------------------------|--------------------------------------------------------|---------|--------|------------------|-----------------------------------|----------------------------------------------------------------|----------------|
|                              |                        | Acres                                                  |         |        |                  |                                   | Number of<br>Harvests                                          | Total<br>Acres |
|                              |                        | Herbicide Use                                          |         | TSI    | Tree<br>Planting |                                   |                                                                |                |
|                              |                        | Site Prep                                              | Release |        |                  |                                   |                                                                |                |
| Forest Industry woodlands    | 1 to 100 acres         | 0                                                      | 73      | 6      | 0                | 23                                | 4                                                              | 50             |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                | 22                                | 5                                                              | 412            |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0      | 0                | 71                                | 29                                                             | 10,795         |
|                              | 100,000 + acres        | 176                                                    | 10,395  | 16,080 | 6,274            | 270                               | 151                                                            | 78,337         |
|                              | Subtotal               | 176                                                    | 10,468  | 16,086 | 6,274            | 386                               | 189                                                            | 89,594         |
| Investor Timberlands         | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                | 2                                 | 2                                                              | 33             |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                | 1                                 | 0                                                              | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 400    | 100              | 18                                | 18                                                             | 2,187          |
|                              | 100,000 + acres        | 0                                                      | 2,628   | 2,427  | 1,003            | 172                               | 158                                                            | 81,165         |
|                              | Subtotal               | 0                                                      | 2,628   | 2,827  | 1,103            | 193                               | 178                                                            | 83,385         |
| Non-Industrial Land          | 1 to 100 acres         | 77                                                     | 21      | 71     | 63               | 2,645                             | 584                                                            | 16,233         |
|                              | 101 to 1,000 acres     | 15                                                     | 20      | 246    | 82               | 1,741                             | 535                                                            | 30,632         |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 269    | 47               | 489                               | 305                                                            | 69,602         |
|                              | 100,000 + acres        | 0                                                      | 0       | 362    | 0                | 89                                | 85                                                             | 23,369         |
|                              | Subtotal               | 92                                                     | 41      | 948    | 192              | 4,964                             | 1,509                                                          | 139,836        |
| Other woodlands (Govt, etc.) | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                | 24                                | 8                                                              | 229            |
|                              | 101 to 1,000 acres     | 0                                                      | 10      | 10     | 3                | 53                                | 37                                                             | 1,769          |
|                              | 1,001 to 100,000 acres | 0                                                      | 5       | 0      | 0                | 40                                | 34                                                             | 3,299          |
|                              | 100,000 + acres        | 0                                                      | 0       | 0      | 0                | 53                                | 51                                                             | 10,469         |
|                              | Subtotal               | 0                                                      | 15      | 10     | 3                | 170                               | 130                                                            | 15,766         |
| 2004 Totals:                 |                        | 268                                                    | 13,152  | 19,871 | 7,573            | 5,713                             | 2,006                                                          | 328,581        |
| 2003 Totals:                 |                        | 1,093                                                  | 18,663  | 26,894 | 10,746           | 4,756                             | 1,856                                                          | 358,611        |
| Change from 2003 to 2004:    |                        | -75%                                                   | -30%    | -26%   | -30%             | 20%                               | 8%                                                             | -8%            |

**Definitions:**

- Ownership Type**
- Forest Industry Land:** Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.
- Institutional Investor Timberlands:** Woodlands owned by organizations, including Timberland Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs) that hold timberland assets as fiduciaries for the benefit of others.
- Non-Industrial Land:** Woodlands privately owned but NOT by a forest industry. These include private individuals and other non-forest product industries.
- Other woodlands:** Woodlands owned by other entities not listed above -- including local, state, federal, or tribal governments.
- Types of Harvests**
- Partial Harvest:** Harvest where trees are removed individually or in small (<5 acre) patches.
- Shelterwood:** Harvest of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.
- Clearcut:** Harvest on a site larger than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Practices Act, Maine Forest Service Rules Chapter 20 for additional information.
- Change of Land Use:** Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.

### Harvesting Trends in Maine 1999-2004



|                     |         |         |         |         |         |         |
|---------------------|---------|---------|---------|---------|---------|---------|
| ◆ Total Harvest     | 537,333 | 569,470 | 565,312 | 561,587 | 511,070 | 507,899 |
| ■ Partial Harvest   | 368,355 | 353,230 | 349,594 | 335,501 | 261,328 | 298,933 |
| ▲ Total Shelterwood | 144,857 | 197,013 | 196,792 | 202,603 | 219,987 | 182,220 |
| × Clearcut          | 18,754  | 13,185  | 14,391  | 18,466  | 24,021  | 18,779  |
| * Land Use Change   | 5,367   | 6,042   | 4,535   | 5,017   | 5,734   | 7,967   |

# 2004 Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2004 Landowner Reports and other survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRSA § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |    |       |     |           |           | All Other Landowners |         |           |           | All Landowners           |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|----|-------|-----|-----------|-----------|----------------------|---------|-----------|-----------|--------------------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |    |       |     |           |           | <u>Acres</u>         |         |           |           |                          |
|              | <u>Acres</u>                          |         | #                            | Acres | 1                                            | 2  | 3     | 4   | Sub Total | Avg. Size | TSI                  | Planted | Clearcut  |           | <u>Acres</u><br>Clearcut |
|              | TSI                                   | Planted |                              |       |                                              |    |       |     |           |           |                      |         | Sub Total | Avg. Size |                          |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 0                    | 0       | 25        | 25        | 25                       |
| Aroostook    | 11,398                                | 3,624   | 0                            | 0     | 2,071                                        | 0  | 374   | 0   | 2,445     | 29        | 62                   | 42      | 299       | 15        | 2,744                    |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 4                    | 0       | 30        | 6         | 30                       |
| Franklin     | 661                                   | 434     | 0                            | 0     | 917                                          | 0  | 366   | 0   | 1,283     | 32        | 1                    | 0       | 173       | 16        | 1,456                    |
| Hancock      | 599                                   | 541     | 2                            | 397   | 511                                          | 40 | 0     | 397 | 948       | 40        | 13                   | 17      | 73        | 10        | 1,021                    |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 40                   | 1       | 0         | 0         | 0                        |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 2                    | 1       | 5         | 5         | 5                        |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 2                    | 0       | 34        | 17        | 34                       |
| Oxford       | 798                                   | 205     | 0                            | 0     | 550                                          | 0  | 0     | 0   | 550       | 50        | 261                  | 47      | 50        | 17        | 600                      |
| Penobscot    | 348                                   | 1,233   | 0                            | 0     | 588                                          | 0  | 0     | 0   | 588       | 24        | 41                   | 3       | 104       | 7         | 692                      |
| Piscataquis  | 2,514                                 | 382     | 1                            | 154   | 974                                          | 0  | 2,931 | 0   | 3,905     | 15        | 127                  | 9       | 263       | 16        | 4,168                    |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 0                    | 0       | 10        | 10        | 10                       |
| Somerset     | 1,948                                 | 716     | 0                            | 0     | 3,938                                        | 0  | 3,206 | 23  | 7,167     | 19        | 413                  | 128     | 527       | 16        | 7,694                    |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 9                    | 42      | 102       | 15        | 102                      |
| Washington   | 603                                   | 142     | 0                            | 0     | 77                                           | 0  | 0     | 0   | 77        | 15        | 24                   | 6       | 106       | 6         | 183                      |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 3                    | 0       | 15        | 8         | 15                       |
| State Total: | 18,869                                | 7,277   | 3                            | 551   | 9,626                                        | 40 | 6,877 | 420 | 16,963    | 27        | 1,002                | 296     | 1,816     | 13        | 18,779                   |

## Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

## Frequency Distribution of Clearcutting for Large Landowners who own more than 100,000 acres

2004 Clearcut as  
percent of statewide  
ownership

# of Landowners

Clearcut Acres

**0% - 0.001%**

**15**

**24**

**0.001%-0.25%**

**7**

**3,963**

**0.26%-0.75%**

**4**

**12,976**

**0.76%-1.00%**

**0**

**0**

# **2005**

## **Silvicultural Activities Report**

### **including Annual Report on Clearcutting and Precommercial Activities**

Compiled from the 2005 Landowner Reports and other survey instruments.  
Data collected under the provisions of Title 12 MRSA §8885 and §8878-A

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**Department of Conservation**  
**Maine Forest Service**  
**Forest Policy and Management Division**  
**#22 SHS, Augusta, ME 04333**  
**(207)287-2791 OR 1-800-367-0223(instate)**  
**[www.maineforestservice.gov](http://www.maineforestservice.gov); [www.bewoodswise.org](http://www.bewoodswise.org)**  
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## Report Highlights

### Harvesting and Land Use Changes

- 531,883 acres were harvested in 2005, a 4% increase from 511,046 acres in 2004.
- 504,419 acres were "partially harvested" (partial and shelterwood totals) in 2005, 4% increase from 484,057 acres in 2004.
- The number of harvests reported decreased 5% from 5,784 to 5,490 harvests.

#### Clearcutting:

1. The total area clearcut increased, from 18,797 acres in 2004 to 21,254 acres in 2005. Clearcutting amounts to less than 5% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 89% of all clearcuts (18,840 acres).
3. Average clearcut size in 2005 was 20 acres. Landowners owning more than 100,000 acres had an average clearcut size of 22 acres. Landowners owning less than 100,000 acres had an average clearcut size of 12 acres. One clearcut larger than 75 acres was created in 2005.
4. The primary silvicultural reasons for clearcutting reported by large landowners was the removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use decreased -24% from 8,192 acres in 2004 to 6,210 acres in 2005.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation increased 212%, from 268 acres in 2004 to 837 acres in 2005.
- To release crop trees from competing vegetation decreased -12%, from 13,152 acres in 2004 to 11,530 acres in 2005.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws decreased -28%, from 19,928 acres in 2004 to 14,358 acres in 2005.
- 91% of this activity was done by landowners owning more than 100,000 acres.

#### Planting:

- Tree planting did not significantly change, from 7,573 acres in 2004 to 7,546 acres in 2005.
- 90% of the planting was by landowners owning more than 100,000 acres.

### Professional Assistance

- In 2005, licensed foresters supervised harvesting on 369,746 acres, compared to 329,475 acres in 2004.
- 70% of all harvest acres in 2005 had a licensed forester involved, compared to 64% of all harvests in 2004.
- Licensed Forester supervision on small woodlots ( $\leq 100$  acres) remained steady at 24% between 2004 and 2005.



## 2005 Harvesting and Land Use Changes

| Commercial Harvest Information by Landowner Size and Type |                        | <u>Acres</u>     |                               |                |                   |               |                 |                |
|-----------------------------------------------------------|------------------------|------------------|-------------------------------|----------------|-------------------|---------------|-----------------|----------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |                |                   | Clearcut      | Land Use Change | Total Harvest  |
|                                                           |                        |                  | Initial or Intermediate Entry | Final Entry    | Total Shelterwood |               |                 |                |
| OwnershipType                                             | Ownership Size         |                  |                               |                |                   |               |                 |                |
| Forest Industry woodlands                                 | 1 to 100 acres         | 1,048            | 7                             | 278            | 285               | 0             | 118             | 1,451          |
|                                                           | 101 to 1,000 acres     | 2,082            | 166                           | 1              | 167               | 0             | 18              | 2,267          |
|                                                           | 1,001 to 100,000 acres | 12,993           | 2,783                         | 5,198          | 7,981             | 718           | 89              | 21,781         |
|                                                           | 100,000 + acres        | 28,677           | 15,902                        | 24,305         | 40,207            | 9,132         | 0               | 78,016         |
|                                                           | SubTotal               | <b>44,800</b>    | <b>18,858</b>                 | <b>29,782</b>  | <b>48,640</b>     | <b>9,850</b>  | <b>225</b>      | <b>103,515</b> |
| Investor Timberlands                                      | 1 to 100 acres         | 34               | 0                             | 0              | 0                 | 0             | 7               | 41             |
|                                                           | 101 to 1,000 acres     | 32               | 28                            | 0              | 28                | 10            | 0               | 70             |
|                                                           | 1,001 to 100,000 acres | 3,751            | 152                           | 4,120          | 4,272             | 50            | 0               | 8,073          |
|                                                           | 100,000 + acres        | 20,761           | 54,589                        | 33,826         | 88,415            | 9,457         | 0               | 118,633        |
|                                                           | SubTotal               | <b>24,578</b>    | <b>54,769</b>                 | <b>37,946</b>  | <b>92,715</b>     | <b>9,517</b>  | <b>7</b>        | <b>126,817</b> |
| Non-Industrial Land                                       | 1 to 100 acres         | 48,477           | 2,453                         | 2,106          | 4,559             | 562           | 3,615           | 57,213         |
|                                                           | 101 to 1,000 acres     | 67,493           | 4,617                         | 4,593          | 9,210             | 450           | 1,463           | 78,616         |
|                                                           | 1,001 to 100,000 acres | 50,423           | 7,246                         | 35,332         | 42,578            | 558           | 670             | 94,229         |
|                                                           | 100,000 + acres        | 35,184           | 6,384                         | 15,918         | 22,302            | 251           | 0               | 57,737         |
|                                                           | SubTotal               | <b>201,577</b>   | <b>20,700</b>                 | <b>57,949</b>  | <b>78,649</b>     | <b>1,821</b>  | <b>5,748</b>    | <b>287,795</b> |
| Other woodlands (Govt, etc.)                              | 1 to 100 acres         | 298              | 14                            | 0              | 14                | 16            | 69              | 397            |
|                                                           | 101 to 1,000 acres     | 1,607            | 69                            | 2              | 71                | 0             | 133             | 1,811          |
|                                                           | 1,001 to 100,000 acres | 2,780            | 881                           | 288            | 1,169             | 50            | 17              | 4,016          |
|                                                           | 100,000 + acres        | 6,793            | 94                            | 634            | 728               | 0             | 11              | 7,532          |
|                                                           | SubTotal               | <b>11,478</b>    | <b>1,058</b>                  | <b>924</b>     | <b>1,982</b>      | <b>66</b>     | <b>230</b>      | <b>13,756</b>  |
| 2005 Totals:                                              |                        | <b>282,433</b>   | <b>95,385</b>                 | <b>126,601</b> | <b>221,986</b>    | <b>21,254</b> | <b>6,210</b>    | <b>531,883</b> |
| Percent of 2005 Harvest:                                  |                        | <b>53.10%</b>    | <b>17.93%</b>                 | <b>23.80%</b>  | <b>41.74%</b>     | <b>4.00%</b>  | <b>1.17%</b>    | <b>100.00%</b> |
| 2004 Totals:                                              |                        | <b>301,479</b>   | <b>85,727</b>                 | <b>96,851</b>  | <b>182,578</b>    | <b>18,797</b> | <b>8,192</b>    | <b>511,046</b> |
| Percent Change from 2004 to 2005:                         |                        | <b>-6%</b>       | <b>11%</b>                    | <b>31%</b>     | <b>22%</b>        | <b>13%</b>    | <b>-24%</b>     | <b>4%</b>      |

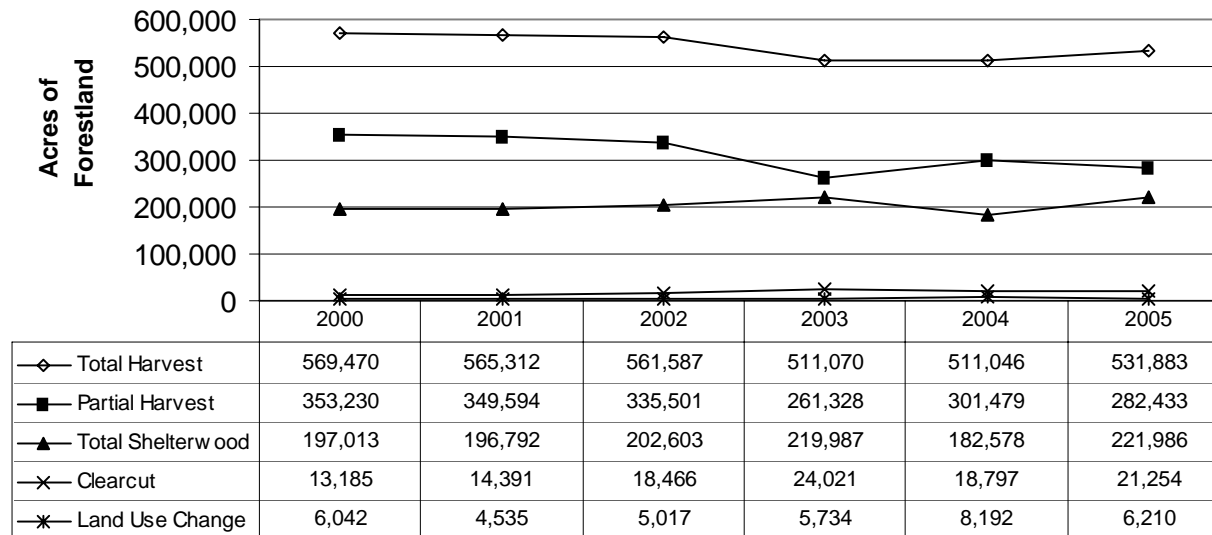
## 2005 Precommercial Activities and Professional Assistance

| OwnershipTypeOwnership Size  |                        | Precommercial Activities<br>by Landowner Size and Type |         |        |                  | Number of<br>Reported<br>Harvests | Licensed Forester<br>Involvement<br>by Landowner Size and Type |                |
|------------------------------|------------------------|--------------------------------------------------------|---------|--------|------------------|-----------------------------------|----------------------------------------------------------------|----------------|
|                              |                        | Acres                                                  |         |        |                  |                                   | Number of<br>Harvests                                          | Total<br>Acres |
|                              |                        | Herbicide Use                                          |         | TSI    | Tree<br>Planting |                                   |                                                                |                |
|                              |                        | Site Prep                                              | Release |        |                  |                                   |                                                                |                |
| Forest Industry woodlands    | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                | 30                                | 3                                                              | 89             |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 5                | 38                                | 7                                                              | 554            |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 6      | 0                | 64                                | 41                                                             | 14,431         |
|                              | 100,000 + acres        | 0                                                      | 7,264   | 5,739  | 4,679            | 140                               | 111                                                            | 42,225         |
|                              | Subtotal               | 0                                                      | 7,264   | 5,745  | 4,684            | 272                               | 162                                                            | 57,299         |
| Investor Timberlands         | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                | 5                                 | 1                                                              | 7              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                | 4                                 | 0                                                              | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 231    | 80               | 22                                | 21                                                             | 8,048          |
|                              | 100,000 + acres        | 0                                                      | 2,624   | 2,190  | 2,146            | 258                               | 239                                                            | 113,479        |
|                              | Subtotal               | 0                                                      | 2,624   | 2,421  | 2,226            | 289                               | 261                                                            | 121,534        |
| Non-Industrial Land          | 1 to 100 acres         | 10                                                     | 0       | 224    | 497              | 2,584                             | 578                                                            | 13,840         |
|                              | 101 to 1,000 acres     | 7                                                      | 14      | 423    | 90               | 1,585                             | 581                                                            | 32,920         |
|                              | 1,001 to 100,000 acres | 820                                                    | 1,090   | 457    | 47               | 456                               | 315                                                            | 78,474         |
|                              | 100,000 + acres        | 0                                                      | 538     | 4,824  | 0                | 162                               | 146                                                            | 52,812         |
|                              | Subtotal               | 837                                                    | 1,642   | 5,928  | 634              | 4,787                             | 1,620                                                          | 178,046        |
| Other woodlands (Govt, etc.) | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                | 19                                | 8                                                              | 169            |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 5      | 2                | 29                                | 19                                                             | 1,375          |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 12     | 0                | 44                                | 36                                                             | 3,801          |
|                              | 100,000 + acres        | 0                                                      | 0       | 247    | 0                | 50                                | 48                                                             | 7,522          |
|                              | Subtotal               | 0                                                      | 0       | 264    | 2                | 142                               | 111                                                            | 12,867         |
| 2005 Totals:                 |                        | 837                                                    | 11,530  | 14,358 | 7,546            | 5,490                             | 2,154                                                          | 369,746        |
| 2004 Totals:                 |                        | 268                                                    | 13,152  | 19,928 | 7,573            | 5,784                             | 2,026                                                          | 329,475        |
| Change from 2004 to 2005:    |                        | 212%                                                   | -12%    | -28%   | 0%               | -5%                               | 6%                                                             | 12%            |

**Definitions:**

- Ownership Type**
- Forest Industry Land:** Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.
- Institutional Investor Timberlands:** Woodlands owned by organizations, including Timberland Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs) that hold timberland assets as fiduciaries for the benefit of others.
- Non-Industrial Land:** Woodlands privately owned but NOT by a forest industry. These include private individuals and other non-forest product industries.
- Other woodlands:** Woodlands owned by other entities not listed above -- including local, state, federal, or tribal governments.
- Types of Harvests**
- Partial Harvest:** Harvest where trees are removed individually or in small (<5 acre) patches.
- Shelterwood:** Harvest of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.
- Clearcut:** Harvest on a site larger than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Practices Act, Maine Forest Service Rules Chapter 20 for additional information.
- Change of Land Use:** Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.

### Harvesting Trends in Maine 2000-2005



## 2005 Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2005 Landowner Reports and other survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRSA § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |   |       |     |           |           | All Other Landowners |         |           |           | All Landowners |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|---|-------|-----|-----------|-----------|----------------------|---------|-----------|-----------|----------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |   |       |     |           |           | <u>Acres</u>         |         |           |           |                |
|              | <u>Acres</u>                          |         | #                            | Acres | 1                                            | 2 | 3     | 4   | Sub Total | Avg. Size | TSI                  | Planted | Clearcut  |           |                |
|              | TSI                                   | Planted |                              |       |                                              |   |       |     |           |           |                      |         | Sub Total | Avg. Size |                |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 8                    | 0       | 34        | 9         | 34             |
| Aroostook    | 7,517                                 | 4,353   | 0                            | 0     | 8,552                                        | 0 | 36    | 0   | 8,588     | 25        | 116                  | 92      | 307       | 13        | 8,895          |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 17                   | 3       | 64        | 9         | 64             |
| Franklin     | 434                                   | 146     | 0                            | 0     | 371                                          | 0 | 0     | 0   | 371       | 37        | 30                   | 6       | 262       | 13        | 633            |
| Hancock      | 0                                     | 152     | 0                            | 0     | 60                                           | 0 | 6     | 0   | 66        | 66        | 59                   | 27      | 170       | 13        | 236            |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 31                   | 1       | 35        | 12        | 35             |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 50                   | 1       | 13        | 13        | 13             |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 2                    | 0       | 15        | 4         | 15             |
| Oxford       | 839                                   | 532     | 0                            | 0     | 99                                           | 0 | 443   | 0   | 542       | 17        | 305                  | 46      | 152       | 12        | 694            |
| Penobscot    | 397                                   | 651     | 0                            | 0     | 0                                            | 0 | 74    | 0   | 74        | 15        | 122                  | 9       | 141       | 11        | 215            |
| Piscataquis  | 1,920                                 | 421     | 0                            | 0     | 1,335                                        | 0 | 1,823 | 0   | 3,158     | 16        | 32                   | 38      | 341       | 17        | 3,499          |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 65                   | 333     | 5         | 5         | 5              |
| Somerset     | 1,339                                 | 503     | 1                            | 87    | 5,391                                        | 0 | 512   | 7   | 5,910     | 22        | 283                  | 137     | 169       | 11        | 6,079          |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 15                   | 14      | 149       | 14        | 149            |
| Washington   | 554                                   | 67      | 0                            | 0     | 0                                            | 0 | 31    | 100 | 131       | 13        | 213                  | 14      | 458       | 12        | 589            |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 10                   | 0       | 99        | 12        | 99             |
| State Total: | 13,000                                | 6,825   | 1                            | 87    | 15,808                                       | 0 | 2,925 | 107 | 18,840    | 22        | 1,358                | 721     | 2,414     | 12        | 21,254         |

### Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

### Frequency Distribution of Clearcutting for Large Landowners who own more than 100,000 acres

2005 Clearcut as  
percent of statewide  
ownership

# of Landowners

Clearcut Acres

**0% - 0.001%**

**15**

**306**

**0.001%-0.25%**

**8**

**10,467**

**0.26%-0.75%**

**3**

**8,067**

**0.76%-1.00%**

**0**

**0**

# **2006**

## **Silvicultural Activities Report**

### **including Annual Report on Clearcutting and Precommercial Activities**

Compiled from the 2006 Landowner Reports and other survey instruments.  
Data collected under the provisions of Title 12 MRSA §8885 and §8878-A

**Published:**  
**August 15, 2007**



**Department of Conservation**  
**Maine Forest Service**  
**Forest Policy and Management Division**  
**#22 SHS, Augusta, ME 04333**  
**(207)287-2791 OR 1-800-367-0223(instate)**  
**[www.maineforestservice.gov](http://www.maineforestservice.gov); [www.bewoodswise.org](http://www.bewoodswise.org)**  
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## Report Highlights

### Harvesting and Land Use Changes

- 521,554 acres were harvested in 2006, a 2% decrease from 532,285 acres in 2005.
- 496,446 acres were "partially harvested" (partial and shelterwood totals) in 2006, 2% decrease from 504,767 acres in 2005.
- The number of harvests reported increased slightly from 5,498 to 5,547 harvests.

#### Clearcutting:

1. The total area clearcut decreased, from 21,278 acres in 2005 to 18,704 acres in 2006. Clearcutting amounts to less than 5% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 88% of all clearcuts (16,479 acres).
3. Average clearcut size in 2006 was 21 acres. Landowners owning more than 100,000 acres had an average clearcut size of 22 acres. Landowners owning less than 100,000 acres had an average clearcut size of 14 acres. Two clearcuts larger than 75 acres were created in 2006.
4. The primary silvicultural reason for clearcutting reported by large landowners were the removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use increased 3% from 6,240 acres in 2005 to 6,403 acres in 2006.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation decreased 83%, from 837 acres in 2005 to 142 acres in 2006.
- To release crop trees from competing vegetation did not significantly change, from 11,530 acres in 2005 to 11,528 acres in 2006.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws decreased 32%, from 14,358 acres in 2005 to 9,709 acres in 2006.
- 85% of this activity was done by landowners owning more than 100,000 acres.

#### Planting:

- Tree planting decreased, from 7,545 acres in 2005 to 4,040 acres in 2006.
- 94% of the planting was by landowners owning more than 100,000 acres.

### Forester Involvement

- In 2006, licensed foresters supervised harvesting on 374,389 acres, compared to 365,974 acres in 2005.
- 72% of all harvest acres in 2006 had a licensed forester involved; the same as 2005.
- Licensed Forester supervision on small woodlots ( $\leq 100$  acres) increased to 28% between 2005 and 2006.

## 2006 Harvesting and Land Use Changes

| Commercial Harvest Information by Landowner Size and Type |                        | <u>Acres</u>     |                               |             |                   |          |                 |               |
|-----------------------------------------------------------|------------------------|------------------|-------------------------------|-------------|-------------------|----------|-----------------|---------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |             |                   | Clearcut | Land Use Change | Total Harvest |
|                                                           |                        |                  | Initial or Intermediate Entry | Final Entry | Total Shelterwood |          |                 |               |
| OwnershipType                                             | Ownership Size         |                  |                               |             |                   |          |                 |               |
| Forest Industry Woodlands                                 | 1 to 100 acres         | 285              | 4                             | 0           | 4                 | 0        | 33              | 322           |
|                                                           | 101 to 1,000 acres     | 587              | 0                             | 0           | 0                 | 0        | 0               | 587           |
|                                                           | 1,001 to 100,000 acres | 3,704            | 791                           | 1,167       | 1,958             | 461      | 64              | 6,187         |
|                                                           | 100,000 + acres        | 27,087           | 15,172                        | 22,593      | 37,765            | 7,015    | 0               | 71,867        |
|                                                           | SubTotal               | 31,663           | 15,967                        | 23,760      | 39,727            | 7,476    | 97              | 78,963        |
| Investor Timberlands                                      | 1 to 100 acres         | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 101 to 1,000 acres     | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 1,001 to 100,000 acres | 2,117            | 1,068                         | 834         | 1,902             | 200      | 0               | 4,219         |
|                                                           | 100,000 + acres        | 17,751           | 79,873                        | 57,079      | 136,952           | 9,292    | 424             | 164,419       |
|                                                           | SubTotal               | 19,868           | 80,941                        | 57,913      | 138,854           | 9,492    | 424             | 168,638       |
| Non-Industrial Land                                       | 1 to 100 acres         | 45,736           | 2,331                         | 2,640       | 4,971             | 254      | 2,667           | 53,628        |
|                                                           | 101 to 1,000 acres     | 61,980           | 3,876                         | 8,253       | 12,129            | 307      | 2,045           | 76,461        |
|                                                           | 1,001 to 100,000 acres | 53,891           | 6,788                         | 12,103      | 18,891            | 753      | 900             | 74,435        |
|                                                           | 100,000 + acres        | 36,513           | 4,923                         | 11,572      | 16,495            | 130      | 200             | 53,338        |
|                                                           | SubTotal               | 198,120          | 17,918                        | 34,568      | 52,486            | 1,444    | 5,812           | 257,862       |
| Other Woodlands (Govt, etc.)                              | 1 to 100 acres         | 157              | 15                            | 42          | 57                | 0        | 18              | 232           |
|                                                           | 101 to 1,000 acres     | 1,488            | 107                           | 24          | 131               | 0        | 38              | 1,657         |
|                                                           | 1,001 to 100,000 acres | 3,586            | 606                           | 366         | 972               | 251      | 12              | 4,821         |
|                                                           | 100,000 + acres        | 7,701            | 654                           | 982         | 1,636             | 42       | 2               | 9,381         |
|                                                           | SubTotal               | 12,932           | 1,382                         | 1,414       | 2,796             | 293      | 70              | 16,091        |
| 2006 Totals:                                              |                        | 262,583          | 116,208                       | 117,655     | 233,863           | 18,704   | 6,403           | 521,554       |
| Percent of 2006 Harvest:                                  |                        | 50.35%           | 22.28%                        | 22.56%      | 44.84%            | 3.59%    | 1.23%           | 100.00%       |
| 2005 Totals:                                              |                        | 282,751          | 95,413                        | 126,603     | 222,016           | 21,278   | 6,240           | 532,285       |
| Percent Change from 2005 to 2006:                         |                        | -7%              | 22%                           | -7%         | 5%                | -12%     | 3%              | -2%           |

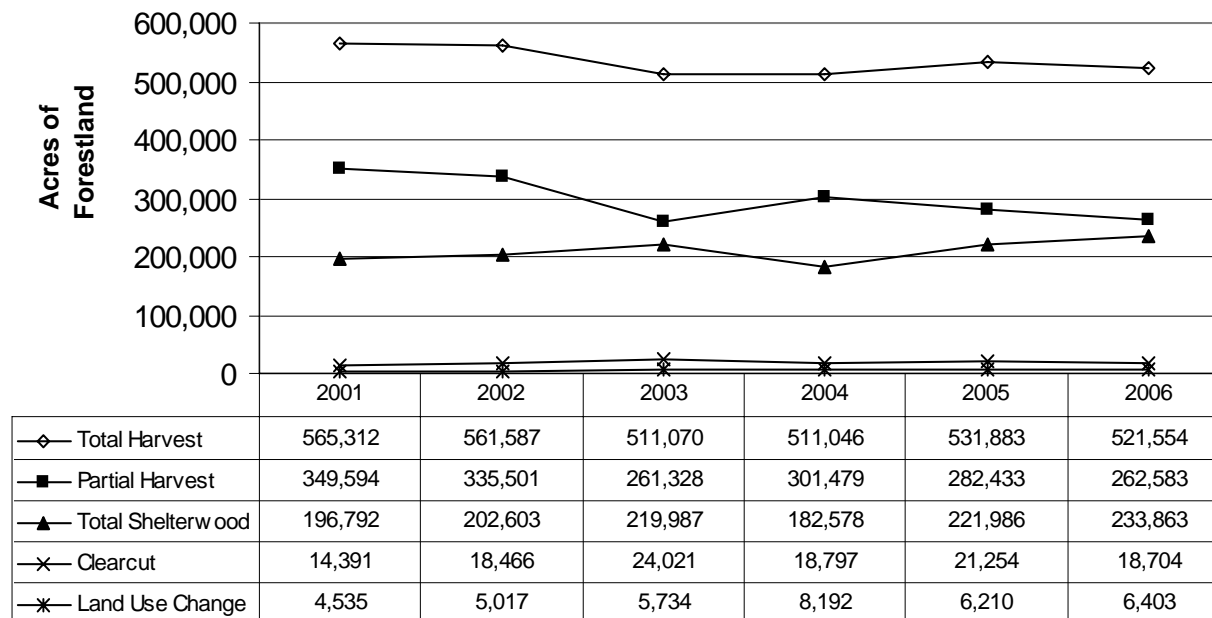
## 2006 Precommercial Activities and Professional Assistance

| OwnershipTypeOwnership Size  |                        | Precommercial Activities<br>by Landowner Size and Type |         |        |                  | Number<br>of<br>Reported |  | Licensed Forester<br>Involvement |                |
|------------------------------|------------------------|--------------------------------------------------------|---------|--------|------------------|--------------------------|--|----------------------------------|----------------|
|                              |                        | Acres                                                  |         |        |                  |                          |  | by Landowner Size and Type       |                |
|                              |                        | Herbicide Use                                          |         | TSI    | Tree<br>Planting |                          |  | Number of<br>Harvests            | Total<br>Acres |
|                              |                        | Site Prep                                              | Release |        |                  |                          |  |                                  |                |
| Forest Industry Woodlands    | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                | 13                       |  | 1                                | 40             |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 3      | 0                | 16                       |  | 2                                | 75             |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0      | 0                | 57                       |  | 43                               | 5,144          |
|                              | 100,000 + acres        | 0                                                      | 7,560   | 5,453  | 3,038            | 142                      |  | 146                              | 54,690         |
|                              | Subtotal               | 0                                                      | 7,560   | 5,456  | 3,038            | 228                      |  | 192                              | 59,949         |
| Investor Timberlands         | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                | 0                        |  | 0                                | 0              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                | 0                        |  | 0                                | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 394    | 46               | 21                       |  | 19                               | 4,179          |
|                              | 100,000 + acres        | 80                                                     | 2,076   | 2,437  | 748              | 306                      |  | 281                              | 148,832        |
|                              | Subtotal               | 80                                                     | 2,076   | 2,831  | 794              | 327                      |  | 300                              | 153,011        |
| Non-Industrial Land          | 1 to 100 acres         | 0                                                      | 30      | 349    | 53               | 2,651                    |  | 613                              | 14,935         |
|                              | 101 to 1,000 acres     | 62                                                     | 12      | 349    | 124              | 1,620                    |  | 552                              | 29,518         |
|                              | 1,001 to 100,000 acres | 0                                                      | 1,850   | 368    | 21               | 430                      |  | 287                              | 52,546         |
|                              | 100,000 + acres        | 0                                                      | 0       | 356    | 0                | 136                      |  | 124                              | 50,012         |
|                              | Subtotal               | 62                                                     | 1,892   | 1,422  | 197              | 4,837                    |  | 1,576                            | 147,011        |
| Other Woodlands (Govt, etc.) | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                | 15                       |  | 5                                | 82             |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 10               | 43                       |  | 28                               | 1,205          |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0      | 0                | 44                       |  | 34                               | 3,750          |
|                              | 100,000 + acres        | 0                                                      | 0       | 0      | 0                | 53                       |  | 53                               | 9,381          |
|                              | Subtotal               | 0                                                      | 0       | 0      | 10               | 155                      |  | 120                              | 14,418         |
|                              |                        |                                                        |         |        |                  |                          |  |                                  |                |
| 2006 Totals:                 |                        | 142                                                    | 11,528  | 9,709  | 4,040            | 5,547                    |  | 2,188                            | 374,389        |
| 2005 Totals:                 |                        | 837                                                    | 11,530  | 14,358 | 7,545            | 5,498                    |  | 2,156                            | 365,973        |
| Change from 2005 to 2006:    |                        | -83%                                                   | 0%      | -32%   | -46%             | 1%                       |  | 1%                               | 2%             |

**Definitions:**

- Ownership Type**
- Forest Industry Land:** Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.
- Investor Timberlands** Woodlands owned by organizations, including Timberland Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs) that hold timberland assets as fiduciaries for the benefit of others.
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- Partial Harvest:** Harvest where trees are removed individually or in small (<5 acre) patches.
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- Clearcut:** Harvest on a site larger than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Practices Act, Maine Forest Service Rules Chapter 20 for additional information.
- Change of Land Use:** Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.

### Harvesting Trends in Maine 2000-2006



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Compiled from the 2006 Landowner Reports and other survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRSA § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |    |       |   |           |           | All Other Landowners |         |           |           | All Landowners |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|----|-------|---|-----------|-----------|----------------------|---------|-----------|-----------|----------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |    |       |   |           |           | <u>Acres</u>         |         |           |           |                |
|              | <u>Acres</u>                          |         | #                            | Acres | 1                                            | 2  | 3     | 4 | Sub Total | Avg. Size | TSI                  | Planted | Clearcut  |           |                |
|              | TSI                                   | Planted |                              |       |                                              |    |       |   |           |           |                      |         | Sub Total | Avg. Size |                |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 58                   | 0       | 0         | 0         | 0              |
| Aroostook    | 3,883                                 | 3,060   | 0                            | 0     | 7,134                                        | 13 | 192   | 0 | 7,339     | 25        | 239                  | 15      | 197       | 15        | 7,536          |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 27                   | 5       | 20        | 20        | 20             |
| Franklin     | 231                                   | 50      | 0                            | 0     | 484                                          | 0  | 98    | 0 | 582       | 25        | 90                   | 0       | 343       | 15        | 925            |
| Hancock      | 0                                     | 0       | 0                            | 0     | 97                                           | 0  | 0     | 0 | 97        | 24        | 52                   | 4       | 68        | 10        | 165            |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 15                   | 1       | 80        | 20        | 80             |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 2                    | 0       | 5         | 5         | 5              |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 6                    | 20      | 15        | 8         | 15             |
| Oxford       | 500                                   | 0       | 0                            | 0     | 144                                          | 0  | 108   | 0 | 252       | 19        | 258                  | 5       | 53        | 11        | 305            |
| Penobscot    | 689                                   | 0       | 0                            | 0     | 134                                          | 0  | 0     | 0 | 134       | 15        | 79                   | 18      | 274       | 17        | 408            |
| Piscataquis  | 803                                   | 17      | 2                            | 355   | 545                                          | 0  | 1,735 | 0 | 2,280     | 18        | 24                   | 85      | 163       | 12        | 2,443          |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 10                   | 0       | 0         | 0         | 0              |
| Somerset     | 1,784                                 | 659     | 0                            | 0     | 5,145                                        | 0  | 634   | 0 | 5,779     | 22        | 441                  | 62      | 259       | 16        | 6,038          |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 25                   | 16      | 53        | 13        | 53             |
| Washington   | 356                                   | 0       | 0                            | 0     | 0                                            | 0  | 10    | 5 | 15        | 8         | 25                   | 3       | 670       | 13        | 685            |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0 | 0         | 0         | 112                  | 20      | 26        | 7         | 26             |
| State Total: | 8,246                                 | 3,786   | 2                            | 355   | 13,683                                       | 13 | 2,777 | 5 | 16,478    | 22        | 1,463                | 254     | 2,226     | 14        | 18,704         |

### Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

### Frequency Distribution of Clearcutting for Large Landowners who own more than 100,000 acres

2006 Clearcut as  
percent of statewide

ownership

# of Landowners

Clearcut Acres

**0% - 0.001%**

**8**

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**0.001%-0.25%**

**11**

**9,091**

**0.26%-0.75%**

**2**

**7,373**

**0.76%-1.00%**

**0**

**0**



**2007**

# **Silvicultural Activities Report**

**including Annual Report on Clearcutting and Precommercial Activities**

Compiled from the 2007 Landowner Reports and other survey instruments.  
Data collected under the provisions of Title 12 MRSA §8885 and §8878-A

**Published:**

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**Department of Conservation**

**Maine Forest Service**

**Forest Policy and Management Division**

**#22 SHS, Augusta, ME 04333**

**(207)287-2791 OR 1-800-367-0223(instate)**

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**This publication is available online at:[www.maineforestservice.gov](http://www.maineforestservice.gov)**

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## Report Highlights

### Harvesting and Land Use Changes

- 505,175 acres were harvested in 2007, a 4% decrease from 527,895 acres in 2006.
- 485,871 acres were "partially harvested" (partial and shelterwood totals) in 2007, a 3% decrease from 502,515 acres in 2006.
- The number of harvests reported increased slightly from 5,622 to 5,634 harvests.

#### Clearcutting:

1. The total area clearcut decreased, from 18,853 acres in 2006 to 12,054 acres in 2007. Clearcutting amounts to less than 3% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 88% of all clearcuts (10,611 acres).
3. Average clearcut size in 2007 was 21 acres. Landowners owning more than 100,000 acres had an average clearcut size of 22 acres. Landowners owning less than 100,000 acres had an average clearcut size of 14 acres. One clearcut larger than 75 acres was created in 2007.
4. The primary silvicultural reason for clearcutting reported by large landowners were the removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use increased 11% from 6,527 acres in 2006 to 7,250 acres in 2007.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation increased 585%, from 142 acres in 2006 to 972 acres in 2007.
- To release crop trees from competing vegetation decreased 16%, from 11,683 acres in 2006 to 9,786 acres in 2007.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws decreased 21%, from 9,813 acres in 2006 to 7,792 acres in 2007.
- 81% of this activity was done by landowners owning more than 100,000 acres.

#### Planting:

- Tree planting increased 11%, from 4,121 acres in 2006 to 4,594 acres in 2007.
- 91% of the planting was by landowners owning more than 100,000 acres.

### Forester Involvement

- In 2007, licensed foresters supervised harvesting on 364,931 acres, compared to 370,158 acres in 2006.
- 72% of all harvest acres in 2007 had a licensed forester involved; the same as 2006.
- Licensed Forester supervision occurred on 24% (675 out of 2,816 harvests) of the harvests on small woodlots ( $\leq 100$  acres) in 2007. This is a slight increase from 23% in 2006 (619 out of 2,679 harvests).

## 2007 Harvesting and Land Use Changes

| Commercial Harvest Information by Landowner Size and Type |                        | <u>Acres</u>     |                               |             |                   |          |                 |               |
|-----------------------------------------------------------|------------------------|------------------|-------------------------------|-------------|-------------------|----------|-----------------|---------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |             |                   | Clearcut | Land Use Change | Total Harvest |
|                                                           |                        |                  | Initial or Intermediate Entry | Final Entry | Total Shelterwood |          |                 |               |
| OwnershipType                                             | Ownership Size         |                  |                               |             |                   |          |                 |               |
| Forest Industry Woodlands                                 | 1 to 100 acres         | 88               | 0                             | 0           | 0                 | 0        | 0               | 88            |
|                                                           | 101 to 1,000 acres     | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 1,001 to 100,000 acres | 2,453            | 2,051                         | 893         | 2,944             | 506      | 38              | 5,941         |
|                                                           | 100,000 + acres        | 29,597           | 17,586                        | 23,034      | 40,620            | 4,079    | 0               | 74,296        |
|                                                           | SubTotal               | 32,138           | 19,637                        | 23,927      | 43,564            | 4,585    | 38              | 80,325        |
| Investor Timberlands                                      | 1 to 100 acres         | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 101 to 1,000 acres     | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 1,001 to 100,000 acres | 10,944           | 1,393                         | 635         | 2,028             | 31       | 0               | 13,003        |
|                                                           | 100,000 + acres        | 20,363           | 46,904                        | 61,927      | 108,831           | 2,639    | 0               | 131,833       |
|                                                           | SubTotal               | 31,307           | 48,297                        | 62,562      | 110,859           | 2,670    | 0               | 144,836       |
| Non-Industrial Land                                       | 1 to 100 acres         | 49,883           | 2,598                         | 3,076       | 5,674             | 299      | 3,024           | 58,880        |
|                                                           | 101 to 1,000 acres     | 61,749           | 6,163                         | 6,375       | 12,538            | 451      | 2,038           | 76,776        |
|                                                           | 1,001 to 100,000 acres | 40,133           | 5,068                         | 16,408      | 21,476            | 144      | 1,207           | 62,960        |
|                                                           | 100,000 + acres        | 21,571           | 21,141                        | 18,436      | 39,577            | 3,761    | 6               | 64,915        |
|                                                           | SubTotal               | 173,336          | 34,970                        | 44,295      | 79,265            | 4,655    | 6,275           | 263,531       |
| Other Woodlands (Govt, etc.)                              | 1 to 100 acres         | 201              | 0                             | 0           | 0                 | 0        | 82              | 283           |
|                                                           | 101 to 1,000 acres     | 938              | 95                            | 63          | 158               | 5        | 12              | 1,113         |
|                                                           | 1,001 to 100,000 acres | 1,927            | 940                           | 431         | 1,371             | 7        | 838             | 4,143         |
|                                                           | 100,000 + acres        | 10,072           | 221                           | 514         | 735               | 132      | 5               | 10,944        |
|                                                           | SubTotal               | 13,138           | 1,256                         | 1,008       | 2,264             | 144      | 937             | 16,483        |
| 2007 Totals:                                              |                        | 249,919          | 104,160                       | 131,792     | 235,952           | 12,054   | 7,250           | 505,175       |
| Percent of 2007 Harvest:                                  |                        | 49.47%           | 20.62%                        | 26.09%      | 46.71%            | 2.39%    | 1.44%           | 100.00%       |
| 2006 Totals:                                              |                        | 266,406          | 117,735                       | 118,374     | 236,109           | 18,853   | 6,527           | 527,895       |
| Percent Change from 2006 to 2007:                         |                        | -6%              | -12%                          | 11%         | 0%                | -36%     | 11%             | -4%           |

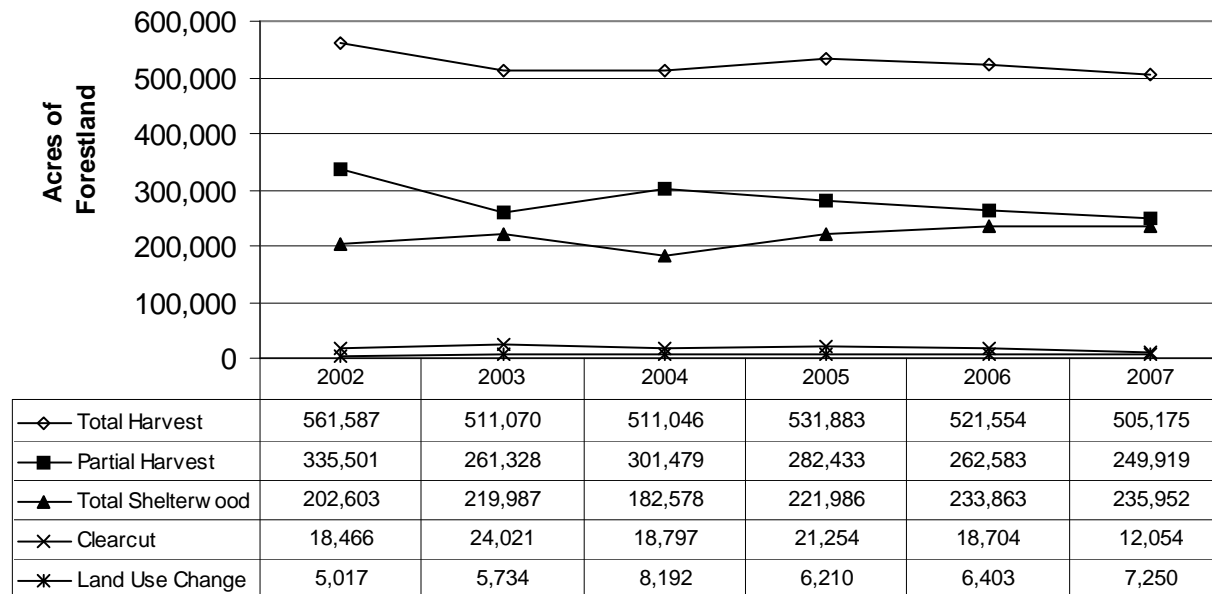
## 2007 Precommercial Activities and Professional Assistance

| OwnershipTypeOwnership Size  |                        | Precommercial Activities<br>by Landowner Size and Type |         |       |                  | Number<br>of<br>Reported |  | Licensed Forester<br>Involvement<br>by Landowner Size and Type |                |
|------------------------------|------------------------|--------------------------------------------------------|---------|-------|------------------|--------------------------|--|----------------------------------------------------------------|----------------|
|                              |                        | Acres                                                  |         |       |                  |                          |  | Number of<br>Harvests                                          | Total<br>Acres |
|                              |                        | Herbicide Use                                          |         | TSI   | Tree<br>Planting |                          |  |                                                                |                |
|                              |                        | Site Prep                                              | Release |       |                  |                          |  |                                                                |                |
| Forest Industry Woodlands    | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                | 3                        |  | 1                                                              | 60             |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                | 0                        |  | 0                                                              | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 0                | 50                       |  | 40                                                             | 4,549          |
|                              | 100,000 + acres        | 0                                                      | 5,789   | 4,162 | 2,226            | 172                      |  | 161                                                            | 51,402         |
|                              | Subtotal               | 0                                                      | 5,789   | 4,162 | 2,226            | 225                      |  | 202                                                            | 56,011         |
| Investor Timberlands         | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                | 0                        |  | 0                                                              | 0              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                | 0                        |  | 0                                                              | 0              |
|                              | 1,001 to 100,000 acres | 300                                                    | 825     | 0     | 92               | 19                       |  | 19                                                             | 13,003         |
|                              | 100,000 + acres        | 80                                                     | 2,146   | 303   | 1,550            | 257                      |  | 239                                                            | 121,478        |
|                              | Subtotal               | 380                                                    | 2,971   | 303   | 1,642            | 276                      |  | 258                                                            | 134,481        |
| Non-Industrial Land          | 1 to 100 acres         | 2                                                      | 27      | 228   | 28               | 2,797                    |  | 669                                                            | 17,369         |
|                              | 101 to 1,000 acres     | 0                                                      | 9       | 665   | 162              | 1,616                    |  | 550                                                            | 28,501         |
|                              | 1,001 to 100,000 acres | 500                                                    | 100     | 601   | 136              | 391                      |  | 254                                                            | 51,015         |
|                              | 100,000 + acres        | 90                                                     | 890     | 1,833 | 399              | 186                      |  | 169                                                            | 61,694         |
|                              | Subtotal               | 592                                                    | 1,026   | 3,327 | 725              | 4,990                    |  | 1,642                                                          | 158,579        |
| Other Woodlands (Govt, etc.) | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                | 16                       |  | 5                                                              | 79             |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                | 31                       |  | 21                                                             | 1,067          |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 1                | 40                       |  | 36                                                             | 4,056          |
|                              | 100,000 + acres        | 0                                                      | 0       | 0     | 0                | 56                       |  | 53                                                             | 10,659         |
|                              | Subtotal               | 0                                                      | 0       | 0     | 1                | 143                      |  | 115                                                            | 15,861         |
| 2007 Totals:                 |                        | 972                                                    | 9,786   | 7,792 | 4,594            | 5,634                    |  | 2,217                                                          | 364,932        |
| 2006 Totals:                 |                        | 142                                                    | 11,683  | 9,813 | 4,121            | 5,622                    |  | 2,196                                                          | 370,157        |
| Change from 2006 to 2007:    |                        | 585%                                                   | -16%    | -21%  | 11%              | 0%                       |  | 1%                                                             | -1%            |

**Definitions:**

- Ownership Type**
- Forest Industry Land:** Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.
- Investor Timberlands** Woodlands owned by organizations, including Timberland Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs) that hold timberland assets as fiduciaries for the benefit of others.
- Non-Industrial Land:** Woodlands privately owned but NOT by a forest industry. These include private individuals and other non-forest product industries.
- Other woodlands:** Woodlands owned by other entities not listed above -- including local, state, federal, or tribal governments.
- Types of Harvests**
- Partial Harvest:** Harvest where trees are removed individually or in small (<5 acre) patches.
- Shelterwood:** Harvest of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.
- Clearcut:** Harvest on a site larger than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Service Rules Chapter 20 for additional information. It can be found on the Maine Forest Service website at [http://www.state.me.us/doc/mfs/rules\\_regs/index.htm](http://www.state.me.us/doc/mfs/rules_regs/index.htm)
- Change of Land Use:** Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.

### Harvesting Trends in Maine 2002-2007





## 2007 Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2007 Landowner Reports and other survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRSA § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |     |       |    |           |           | All Other Landowners |         |           |           | All Landowners |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|-----|-------|----|-----------|-----------|----------------------|---------|-----------|-----------|----------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |     |       |    |           |           | <u>Acres</u>         |         |           |           |                |
|              | <u>Acres</u>                          |         | #                            | Acres | 1                                            | 2   | 3     | 4  | Sub Total | Avg. Size | TSI                  | Planted | Clearcut  |           |                |
|              | TSI                                   | Planted |                              |       |                                              |     |       |    |           |           |                      |         | Sub Total | Avg. Size |                |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0  | 0         | 0         | 20                   | 0       | 8         | 8         | 8              |
| Aroostook    | 2,695                                 | 3,052   | 0                            | 0     | 4,260                                        | 0   | 0     | 0  | 4,260     | 23        | 131                  | 22      | 100       | 13        | 4,360          |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0  | 0         | 0         | 0                    | 1       | 19        | 10        | 19             |
| Franklin     | 95                                    | 0       | 1                            | 229   | 226                                          | 0   | 401   | 0  | 627       | 39        | 8                    | 0       | 517       | 21        | 1,144          |
| Hancock      | 0                                     | 0       | 0                            | 0     | 0                                            | 90  | 80    | 0  | 170       | 19        | 105                  | 1       | 145       | 16        | 315            |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0  | 0         | 0         | 44                   | 145     | 26        | 9         | 26             |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0  | 0         | 0         | 1                    | 0       | 5         | 5         | 5              |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0  | 0         | 0         | 250                  | 0       | 30        | 10        | 30             |
| Oxford       | 420                                   | 0       | 0                            | 0     | 29                                           | 0   | 170   | 0  | 199       | 13        | 430                  | 25      | 75        | 11        | 274            |
| Penobscot    | 239                                   | 281     | 0                            | 0     | 374                                          | 0   | 0     | 0  | 374       | 25        | 100                  | 75      | 63        | 13        | 437            |
| Piscataquis  | 603                                   | 435     | 0                            | 0     | 159                                          | 0   | 391   | 48 | 598       | 23        | 20                   | 0       | 98        | 12        | 696            |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0  | 0         | 0         | 0                    | 0       | 13        | 13        | 13             |
| Somerset     | 1,970                                 | 406     | 0                            | 0     | 3,728                                        | 0   | 572   | 0  | 4,300     | 20        | 93                   | 98      | 162       | 12        | 4,462          |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0  | 0         | 0         | 73                   | 1       | 36        | 7         | 36             |
| Washington   | 276                                   | 0       | 0                            | 0     | 0                                            | 42  | 29    | 0  | 83        | 16        | 210                  | 45      | 136       | 23        | 219            |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0  | 0         | 0         | 9                    | 6       | 10        | 5         | 10             |
| State Total: | 6,298                                 | 4,174   | 1                            | 229   | 8,776                                        | 132 | 1,643 | 48 | 10,611    | 22        | 1,494                | 419     | 1,443     | 14        | 12,054         |

### Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

### Frequency Distribution of Clearcutting for Large Landowners who own more than 100,000 acres

2007 Clearcut as  
percent of statewide

| <u>ownership</u>    | <u># of Landowners</u> | <u>Clearcut Acres</u> |
|---------------------|------------------------|-----------------------|
| <b>0% - 0.001%</b>  | <b>16</b>              | <b>690</b>            |
| <b>0.001%-0.25%</b> | <b>6</b>               | <b>5,957</b>          |
| <b>0.26%-0.75%</b>  | <b>2</b>               | <b>3,964</b>          |
| <b>0.76%-1.00%</b>  | <b>0</b>               | <b>0</b>              |

# **2008**

## **Silvicultural Activities Report**

### **including Annual Report on Clearcutting and Precommercial Activities**

Compiled from the 2008 Landowner Reports and other survey instruments.  
Data collected under the provisions of Title 12 MRSA §8885 and §8878-A

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**Department of Conservation**  
**Maine Forest Service**  
**Forest Policy and Management Division**  
**#22 SHS, Augusta, ME 04333**  
**(207)287-2791 OR 1-800-367-0223(instate)**  
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## Report Highlights

### Harvesting and Land Use Changes

- 462,892 acres were harvested in 2008, an 8% decrease from 505,878 acres in 2007.
- 447,977 acres were "partially harvested" (partial and shelterwood totals) in 2008, an 8% decrease from 487,448 acres in 2007.
- The number of harvests reported decreased from 5,675 to 5,329.

#### Clearcutting:

1. The total area clearcut decreased, from 11,065 acres in 2007 to 10,069 acres in 2008. Clearcutting amounts to less than 3% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 94% of all clearcuts (9,508 acres).
3. Average clearcut size in 2008 was 25 acres. Landowners owning more than 100,000 acres had an average clearcut size of 27 acres. Landowners owning less than 100,000 acres had an average clearcut size of 11 acres. One clearcut larger than 75 acres was created in 2008.
4. The primary silvicultural reason for clearcutting reported by large landowners was the removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use decreased -34% from 7,365 acres in 2007 to 4,846 acres in 2008.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation decreased -53%, from 972 acres in 2007 to 452 acres in 2008.
- To release crop trees from competing vegetation decreased 11%, from 9,786 acres in 2007 to 8,747 acres in 2008.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws increased 15%, from 7,795 acres in 2007 to 8,947 acres in 2008.
- 99% of this activity was done by landowners owning more than 100,000 acres.

#### Planting:

- Tree planting decreased -15%, from 4,593 acres in 2007 to 3,884 acres in 2008.
- 98% of the planting was by landowners owning more than 100,000 acres.

### Forester Involvement

- In 2008, licensed foresters supervised harvesting on 306,888 acres, compared to 362,509 acres in 2007.
- 66% of all harvest acres in 2008 had a licensed forester involved; the same as 2007.
- Licensed Forester supervision occurred on 22% (557 out of 2,581 harvests) of the harvests on small woodlots ( $\leq 100$  acres) in 2008. This is a slight decrease from 24% in 2007 (680 out of 2,840 harvests).

## 2008 Harvesting and Land Use Changes

| Commercial Harvest Information by Landowner Size and Type |                        | Acres            |                               |             |                   |          |                 |               |
|-----------------------------------------------------------|------------------------|------------------|-------------------------------|-------------|-------------------|----------|-----------------|---------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |             |                   | Clearcut | Land Use Change | Total Harvest |
|                                                           |                        |                  | Initial or Intermediate Entry | Final Entry | Total Shelterwood |          |                 |               |
| <b>OwnershipType</b>                                      | <b>Ownership Size</b>  |                  |                               |             |                   |          |                 |               |
| <b>Forest Industry Woodlands</b>                          | 1 to 100 acres         | 109              | 10                            | 70          | 80                | 0        | 0               | 189           |
|                                                           | 101 to 1,000 acres     | 191              | 46                            | 0           | 46                | 0        | 0               | 237           |
|                                                           | 1,001 to 100,000 acres | 6,739            | 2,449                         | 842         | 3,291             | 35       | 64              | 10,129        |
|                                                           | 100,000 + acres        | 16,323           | 22,119                        | 21,265      | 43,384            | 3,791    | 0               | 63,498        |
|                                                           | SubTotal               | 23,362           | 24,624                        | 22,177      | 46,801            | 3,826    | 64              | 74,053        |
| <b>Investor Timberlands</b>                               | 1 to 100 acres         | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 101 to 1,000 acres     | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 1,001 to 100,000 acres | 755              | 600                           | 290         | 890               | 0        | 0               | 1,645         |
|                                                           | 100,000 + acres        | 27,819           | 31,959                        | 51,961      | 83,920            | 2,391    | 57              | 114,187       |
|                                                           | SubTotal               | 28,574           | 32,559                        | 52,251      | 84,810            | 2,391    | 57              | 115,832       |
| <b>Non-Industrial Land</b>                                | 1 to 100 acres         | 47,199           | 2,238                         | 1,823       | 4,061             | 162      | 2,279           | 53,701        |
|                                                           | 101 to 1,000 acres     | 66,858           | 3,834                         | 3,506       | 7,340             | 231      | 898             | 75,327        |
|                                                           | 1,001 to 100,000 acres | 37,046           | 4,697                         | 19,947      | 24,644            | 68       | 791             | 62,549        |
|                                                           | 100,000 + acres        | 15,925           | 22,947                        | 16,483      | 39,430            | 3,326    | 232             | 58,913        |
|                                                           | SubTotal               | 167,028          | 33,716                        | 41,759      | 75,475            | 3,787    | 4,200           | 250,490       |
| <b>Other Woodlands (Govt, etc.)</b>                       | 1 to 100 acres         | 142              | 0                             | 60          | 60                | 0        | 45              | 247           |
|                                                           | 101 to 1,000 acres     | 2,879            | 633                           | 452         | 1,085             | 12       | 154             | 4,130         |
|                                                           | 1,001 to 100,000 acres | 2,839            | 985                           | 547         | 1,532             | 53       | 323             | 4,747         |
|                                                           | 100,000 + acres        | 11,308           | 1,111                         | 971         | 2,082             | 0        | 3               | 13,393        |
|                                                           | SubTotal               | 17,168           | 2,729                         | 2,030       | 4,759             | 65       | 525             | 22,517        |
| <b>2008 Totals:</b>                                       |                        | 236,132          | 93,628                        | 118,217     | 211,845           | 10,069   | 4,846           | 462,892       |
| <b>Percent of 2008 Harvest:</b>                           |                        | 51.01%           | 20.23%                        | 25.54%      | 45.77%            | 2.18%    | 1.05%           | 100.00%       |
| <b>2007 Totals:</b>                                       |                        | 251,233          | 104,259                       | 131,956     | 236,215           | 11,065   | 7,365           | 505,878       |
| <b>Percent Change from 2007 to 2008:</b>                  |                        | -6%              | -10%                          | -10%        | -10%              | -9%      | -34%            | -8%           |

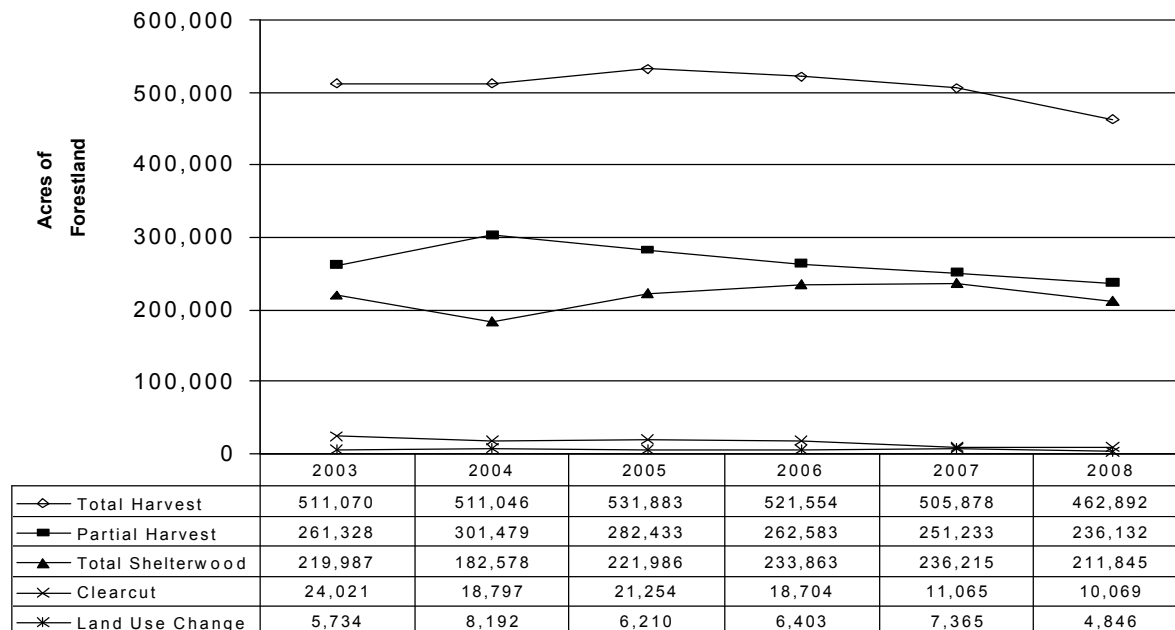
## 2008 Precommercial Activities and Professional Assistance

| OwnershipTypeOwnership Size  |                        | Precommercial Activities<br>by Landowner Size and Type |         |       |                  |  | Number<br>of<br>Reported<br>Harvests | Licensed Forester<br>Involvement |                |
|------------------------------|------------------------|--------------------------------------------------------|---------|-------|------------------|--|--------------------------------------|----------------------------------|----------------|
|                              |                        | Acres                                                  |         |       |                  |  |                                      | by Landowner Size and Type       |                |
|                              |                        | Herbicide Use                                          |         | TSI   | Tree<br>Planting |  |                                      | Number of<br>Harvests            | Total<br>Acres |
|                              |                        | Site Prep                                              | Release |       |                  |  |                                      |                                  |                |
| Forest Industry Woodlands    | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 4                                    | 0                                | 0              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                |  | 6                                    | 1                                | 100            |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 28               |  | 44                                   | 32                               | 5,316          |
|                              | 100,000 + acres        | 0                                                      | 6,725   | 3,465 | 2,480            |  | 131                                  | 120                              | 41,057         |
|                              | Subtotal               | 0                                                      | 6,725   | 3,465 | 2,508            |  | 185                                  | 153                              | 46,473         |
| Investor Timberlands         | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 0                                    | 0                                | 0              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                |  | 0                                    | 0                                | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 0                |  | 6                                    | 5                                | 945            |
|                              | 100,000 + acres        | 300                                                    | 1,874   | 1,167 | 610              |  | 244                                  | 229                              | 104,332        |
|                              | Subtotal               | 300                                                    | 1,874   | 1,167 | 610              |  | 250                                  | 234                              | 105,277        |
| Non-Industrial Land          | 1 to 100 acres         | 25                                                     | 0       | 95    | 46               |  | 2,559                                | 550                              | 12,854         |
|                              | 101 to 1,000 acres     | 8                                                      | 8       | 27    | 16               |  | 1,565                                | 513                              | 26,497         |
|                              | 1,001 to 100,000 acres | 119                                                    | 140     | 0     | 0                |  | 415                                  | 242                              | 46,826         |
|                              | 100,000 + acres        | 0                                                      | 0       | 4,183 | 699              |  | 181                                  | 155                              | 51,335         |
|                              | Subtotal               | 152                                                    | 148     | 4,305 | 761              |  | 4,720                                | 1,460                            | 137,512        |
| Other Woodlands (Govt, etc.) | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 18                                   | 7                                | 125            |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                |  | 34                                   | 20                               | 1,505          |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 10    | 5                |  | 46                                   | 31                               | 4,372          |
|                              | 100,000 + acres        | 0                                                      | 0       | 0     | 0                |  | 76                                   | 65                               | 11,624         |
|                              | Subtotal               | 0                                                      | 0       | 10    | 5                |  | 174                                  | 123                              | 17,626         |
| 2008 Totals:                 |                        | 452                                                    | 8,747   | 8,947 | 3,884            |  | 5,329                                | 1,970                            | 306,888        |
| 2007 Totals:                 |                        | 972                                                    | 9,786   | 7,795 | 4,593            |  | 5,675                                | 2,225                            | 362,509        |
| Change from 2007 to 2008:    |                        | -53%                                                   | -11%    | 15%   | -15%             |  | -6%                                  | -11%                             | -15%           |



**Definitions:**

- Ownership Type**
- Forest Industry Land:** Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.
- Investor Timberlands** Woodlands owned by organizations, including Timberland Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs) that hold timberland assets as fiduciaries for the benefit of others.
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- Other woodlands:** Woodlands owned by other entities not listed above -- including local, state, federal, or tribal governments.
- Types of Harvests**
- Partial Harvest:** Harvest where trees are removed individually or in small (<5 acre) patches.
- Shelterwood:** Harvest of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.
- Clearcut:** Harvest on a site larger than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Service Rules Chapter 20 for additional information. It can be found on the Maine Forest Service website at [http://www.state.me.us/doc/mfs/rules\\_regs/index.htm](http://www.state.me.us/doc/mfs/rules_regs/index.htm)
- Change of Land Use.** Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.

**Harvesting Trends in Maine 2003-2008**

## 2008 Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2008 Landowner Reports and other survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRSA § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |    |       |     |           |           | All Other Landowners |         |           |           | All Landowners           |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|----|-------|-----|-----------|-----------|----------------------|---------|-----------|-----------|--------------------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |    |       |     |           |           | <u>Acres</u>         |         |           |           |                          |
|              | <u>Acres</u>                          |         | #                            | Acres | <u>Acres</u>                                 |    |       |     |           |           | TSI                  | Planted | Clearcut  |           | <u>Acres</u><br>Clearcut |
|              | TSI                                   | Planted |                              |       | 1                                            | 2  | 3     | 4   | Sub Total | Avg. Size |                      |         | Sub Total | Avg. Size |                          |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 1                    | 0       | 15        | 8         | 15                       |
| Aroostook    | 3,607                                 | 2,805   | 1                            | 125   | 4,369                                        | 0  | 335   | 0   | 4,704     | 30        | 65                   | 0       | 76        | 15        | 4,780                    |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 0                    | 0       | 0         | 0         | 0                        |
| Franklin     | 0                                     | 50      | 0                            | 0     | 0                                            | 0  | 537   | 0   | 537       | 38        | 0                    | 0       | 8         | 8         | 545                      |
| Hancock      | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 60    | 0   | 60        | 30        | 16                   | 0       | 40        | 10        | 100                      |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 0                    | 0       | 0         | 0         | 0                        |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 0                    | 0       | 0         | 0         | 0                        |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 0                    | 0       | 43        | 14        | 43                       |
| Oxford       | 0                                     | 0       | 0                            | 0     | 70                                           | 0  | 468   | 0   | 538       | 19        | 0                    | 0       | 14        | 7         | 552                      |
| Penobscot    | 0                                     | 60      | 0                            | 0     | 151                                          | 49 | 144   | 0   | 344       | 18        | 25                   | 57      | 12        | 12        | 356                      |
| Piscataquis  | 1,721                                 | 61      | 0                            | 0     | 153                                          | 0  | 1,046 | 0   | 1,199     | 28        | 0                    | 0       | 110       | 18        | 1,309                    |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 0                    | 0       | 0         | 0         | 0                        |
| Somerset     | 3,125                                 | 813     | 0                            | 0     | 1,710                                        | 12 | 169   | 114 | 2,005     | 24        | 25                   | 33      | 129       | 12        | 2,134                    |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 0                    | 0       | 6         | 6         | 6                        |
| Washington   | 362                                   | 0       | 0                            | 0     | 0                                            | 0  | 121   | 0   | 121       | 15        | 0                    | 0       | 108       | 8         | 229                      |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 0                    | 5       | 0         | 0         | 0                        |
| State Total: | 8,815                                 | 3,789   | 1                            | 125   | 6,453                                        | 61 | 2,880 | 114 | 9,508     | 27        | 132                  | 95      | 561       | 11        | 10,069                   |

### Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

### Frequency Distribution of Clearcutting for Large Landowners who own more than 100,000 acres

2008 Clearcut as  
percent of statewide  
ownership

# of Landowners

Clearcut Acres

|                     |           |              |
|---------------------|-----------|--------------|
| <b>0% - 0.001%</b>  | <b>15</b> | <b>1,820</b> |
| <b>0.001%-0.25%</b> | <b>6</b>  | <b>5,515</b> |
| <b>0.26%-0.75%</b>  | <b>1</b>  | <b>2,173</b> |
| <b>0.76%-1.00%</b>  | <b>0</b>  | <b>0</b>     |

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## Maine Forest Service District Foresters

### Dennis Brennan

2281 Alfred Road  
Lyman, ME 04002  
Phone: (207)324-7000  
E-mail: dennis.brennan@maine.gov

### Morten Moesswilde

536 Waldoboro Road  
Jefferson, ME 04348  
Phone: (207)549-9003  
E-mail:

### Steve MacDonald

P.O. Box 130  
Jonesboro, ME 04468  
Phone: (207) 434-2622  
E-mail:

### Jim Ecker

P.O. Box 415  
Old Town, ME 04468  
Phone: (207) 827-1811  
E-mail: jim.ecker@maine.gov

### Dan Jacobs

2 Forestry Road  
Island Falls, ME 04747  
Phone: (207) 463-3653  
E-mail: dan.jacobs@maine.gov

### Ken Canfield

356 Shaker Road  
Gray, ME 04039  
Phone: (207) 657-3535  
E-mail: ken.canfield@maine.gov

### Patty Cormier

PO Box 416  
Norridgewock, ME 04957  
Phone: (207) 474-3499  
E-mail: patty.cormier@maine.gov

### Gordon Moore

P.O. Box 1107  
Greenville, ME 04441  
Phone: (207) 695-3721  
E-mail: gordon.moore@maine.gov

### Merle Ring

131 Bethel Road  
West Paris, ME 04289  
Phone: (207) 674-3787  
E-mail: merle.ring@maine.gov

### Dave Rochester

45 Radar Road  
Ashland, ME 04732  
Phone: (207) 435-7963  
E-mail: dave.rochester@maine.gov

**Maine Forest Service - Main Office - Augusta** 1-800-367-0223 (instate) or 207-287-2791  
email: forestinfo@maine.gov

**2009**

# **Silvicultural Activities Report**

**including Annual Report on Clearcutting and Precommercial Activities**

Compiled from the 2009 Landowner Reports and other survey instruments.  
Data collected under the provisions of Title 12 MRSA §8885 and §8878-A

**Published:**

**November 19, 2010**



**Department of Conservation**

**Maine Forest Service**

**Forest Policy and Management Division**

**#22 SHS, Augusta, ME 04333**

**(207)287-2791 OR 1-800-367-0223(instate)**

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## Report Highlights

### Harvesting and Land Use Changes

- 394,100 acres were harvested in 2009, a 15% decrease from 463,200 acres in 2008.
- 374,963 acres were "partially harvested" (partial and shelterwood totals) in 2009, a 16% decrease from 448,277 acres in 2008.
- The number of harvests reported decreased from 5,340 to 4,853.

#### Clearcutting:

1. The total area clearcut increased, from 10,075 acres in 2008 to 14,866 acres in 2009. Clearcutting amounts to less than 4% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 93% of all clearcuts (13,765 acres).
3. Average clearcut size in 2009 was 23 acres. Landowners owning more than 100,000 acres had an average clearcut size of 24 acres. Landowners owning less than 100,000 acres had an average clearcut size of 12 acres. Three clearcuts larger than 75 acres were created in 2009.
4. The primary silvicultural reason for clearcutting reported by large landowners was the removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use decreased -12% from 4,848 acres in 2008 to 4,271 acres in 2009.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation decreased -95%, from 452 acres in 2008 to 22 acres in 2009.
- To release crop trees from competing vegetation increased 25%, from 8,747 acres in 2008 to 10,892 acres in 2009.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws decreased -57%, from 8,947 acres in 2008 to 3,886 acres in 2009.  
89% of this activity was done by landowners owning more than 100,000 acres (3,444 acres).

#### Planting:

- Tree planting decreased -27%, from 3,889 acres in 2008 to 2,852 acres in 2009.  
91% of the planting was by landowners owning more than 100,000 acres (2,599 acres).

### Forester Involvement

- In 2009, licensed foresters supervised harvesting on 273,038 acres, compared to 299,809 acres in 2008.  
69% of all harvest acres in 2009 had a licensed forester involved; a slight increase from 2008 (65%).  
Licensed Forester supervision occurred on 24% (563 out of 2,315 harvests) of the harvests on family forests (<= 100 acres) in 2009. This is a slight increase from 22% in 2008 (557 out of 2,581 harvests).

## 2009 Harvesting and Land Use Changes

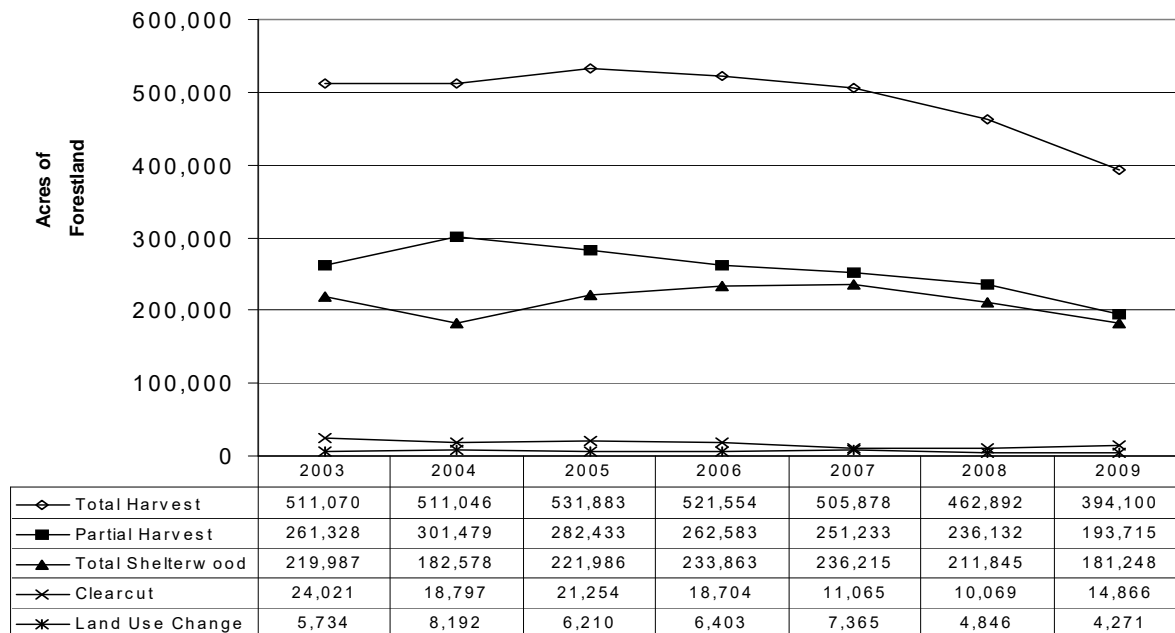
| Commercial Harvest Information by Landowner Size and Type |                        | <u>Acres</u>     |                               |             |                   |          |                 |               |
|-----------------------------------------------------------|------------------------|------------------|-------------------------------|-------------|-------------------|----------|-----------------|---------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |             |                   | Clearcut | Land Use Change | Total Harvest |
|                                                           |                        |                  | Initial or Intermediate Entry | Final Entry | Total Shelterwood |          |                 |               |
| OwnershipType                                             | Ownership Size         |                  |                               |             |                   |          |                 |               |
| Forest Industry Woodlands                                 | 1 to 100 acres         | 24               | 0                             | 0           | 0                 | 0        | 10              | 34            |
|                                                           | 101 to 1,000 acres     | 479              | 0                             | 0           | 0                 | 0        | 0               | 479           |
|                                                           | 1,001 to 100,000 acres | 6,667            | 2,018                         | 412         | 2,430             | 157      | 402             | 9,656         |
|                                                           | 100,000 + acres        | 9,838            | 23,247                        | 24,983      | 48,230            | 2,824    | 0               | 60,892        |
|                                                           | SubTotal               | 17,008           | 25,265                        | 25,395      | 50,660            | 2,981    | 412             | 71,061        |
| Investor Timberlands                                      | 1 to 100 acres         | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 101 to 1,000 acres     | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 1,001 to 100,000 acres | 1,316            | 922                           | 1,991       | 2,913             | 0        | 0               | 4,229         |
|                                                           | 100,000 + acres        | 29,568           | 27,094                        | 39,551      | 66,645            | 5,163    | 152             | 101,528       |
|                                                           | SubTotal               | 30,884           | 28,016                        | 41,542      | 69,558            | 5,163    | 152             | 105,757       |
| Non-Industrial Land                                       | 1 to 100 acres         | 37,446           | 1,811                         | 3,632       | 5,443             | 411      | 1,636           | 44,936        |
|                                                           | 101 to 1,000 acres     | 51,888           | 4,679                         | 3,152       | 7,831             | 317      | 1,023           | 61,059        |
|                                                           | 1,001 to 100,000 acres | 26,479           | 4,990                         | 11,027      | 16,017            | 188      | 709             | 43,393        |
|                                                           | 100,000 + acres        | 13,435           | 20,852                        | 9,142       | 29,994            | 5,778    | 47              | 49,254        |
|                                                           | SubTotal               | 129,248          | 32,332                        | 26,953      | 59,285            | 6,694    | 3,415           | 198,642       |
| Other Woodlands (Govt, etc.)                              | 1 to 100 acres         | 282              | 29                            | 0           | 29                | 8        | 23              | 342           |
|                                                           | 101 to 1,000 acres     | 723              | 0                             | 180         | 180               | 20       | 177             | 1,100         |
|                                                           | 1,001 to 100,000 acres | 1,716            | 340                           | 633         | 973               | 0        | 79              | 2,768         |
|                                                           | 100,000 + acres        | 13,854           | 478                           | 85          | 563               | 0        | 13              | 14,430        |
|                                                           | SubTotal               | 16,575           | 847                           | 898         | 1,745             | 28       | 292             | 18,640        |
| 2009 Totals:                                              |                        | 193,715          | 86,460                        | 94,788      | 181,248           | 14,866   | 4,271           | 394,100       |
| Percent of 2009 Harvest:                                  |                        | 49.15%           | 21.94%                        | 24.05%      | 45.99%            | 3.77%    | 1.08%           | 100.00%       |
| 2008 Totals:                                              |                        | 236,432          | 93,628                        | 118,217     | 211,845           | 10,075   | 4,848           | 463,200       |
| Percent Change from 2008 to 2009:                         |                        | -18%             | -8%                           | -20%        | -14%              | 48%      | -12%            | -15%          |

## 2009 Precommercial Activities and Professional Assistance

| OwnershipTypeOwnership Size  |                        | Precommercial Activities<br>by Landowner Size and Type |         |       |                  |  | Number<br>of<br>Reported<br>Harvests | Licensed Forester<br>Involvement |                |
|------------------------------|------------------------|--------------------------------------------------------|---------|-------|------------------|--|--------------------------------------|----------------------------------|----------------|
|                              |                        | Acres                                                  |         |       |                  |  |                                      | by Landowner Size and Type       |                |
|                              |                        | Herbicide Use                                          |         | TSI   | Tree<br>Planting |  |                                      | Number of<br>Harvests            | Total<br>Acres |
|                              |                        | Site Prep                                              | Release |       |                  |  |                                      |                                  |                |
| Forest Industry Woodlands    | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 3                                    | 2                                | 20             |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                |  | 6                                    | 4                                | 399            |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 137              |  | 61                                   | 40                               | 5,765          |
|                              | 100,000 + acres        | 0                                                      | 6,431   | 3,174 | 1,936            |  | 173                                  | 161                              | 39,436         |
|                              | Subtotal               | 0                                                      | 6,431   | 3,174 | 2,073            |  | 243                                  | 207                              | 45,620         |
| Investor Timberlands         | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 0                                    | 0                                | 0              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                |  | 0                                    | 0                                | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 0                |  | 12                                   | 11                               | 4,204          |
|                              | 100,000 + acres        | 0                                                      | 3,564   | 0     | 608              |  | 213                                  | 199                              | 91,614         |
|                              | Subtotal               | 0                                                      | 3,564   | 0     | 608              |  | 225                                  | 210                              | 95,818         |
| Non-Industrial Land          | 1 to 100 acres         | 15                                                     | 10      | 162   | 13               |  | 2,298                                | 553                              | 12,852         |
|                              | 101 to 1,000 acres     | 7                                                      | 0       | 262   | 52               |  | 1,408                                | 504                              | 24,605         |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 15    | 25               |  | 354                                  | 224                              | 32,047         |
|                              | 100,000 + acres        | 0                                                      | 887     | 270   | 55               |  | 176                                  | 164                              | 44,588         |
|                              | Subtotal               | 22                                                     | 897     | 709   | 145              |  | 4,236                                | 1,445                            | 114,092        |
| Other Woodlands (Govt, etc.) | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 14                                   | 8                                | 305            |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 24               |  | 32                                   | 22                               | 879            |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 3     | 2                |  | 42                                   | 35                               | 2,408          |
|                              | 100,000 + acres        | 0                                                      | 0       | 0     | 0                |  | 61                                   | 57                               | 13,916         |
|                              | Subtotal               | 0                                                      | 0       | 3     | 26               |  | 149                                  | 122                              | 17,508         |
| 2009 Totals:                 |                        | 22                                                     | 10,892  | 3,886 | 2,852            |  | 4,853                                | 1,984                            | 273,038        |
| 2008 Totals:                 |                        | 452                                                    | 8,747   | 8,947 | 3,889            |  | 5,340                                | 1,957                            | 299,809        |
| Change from 2008 to 2009:    |                        | -95%                                                   | 25%     | -57%  | -27%             |  | -9%                                  | 1%                               | -9%            |

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|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|-----|-------|-----|-----------|-----------|----------------------|---------|-----------|-----------|----------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |     |       |     |           |           | <u>Acres</u>         |         |           |           |                |
|              | <u>Acres</u>                          |         | #                            | Acres | 1                                            | 2   | 3     | 4   | Sub Total | Avg. Size | TSI                  | Planted | Clearcut  |           |                |
|              | TSI                                   | Planted |                              |       |                                              |     |       |     |           |           |                      |         | Sub Total | Avg. Size |                |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 8                    | 0       | 30        | 10        | 30             |
| Aroostook    | 1,447                                 | 2,159   | 0                            | 0     | 2,683                                        | 0   | 86    | 11  | 2,780     | 32        | 59                   | 0       | 116       | 23        | 2,896          |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 0                    | 5       | 19        | 10        | 19             |
| Franklin     | 0                                     | 0       | 0                            | 0     | 1,383                                        | 0   | 200   | 0   | 1,583     | 21        | 6                    | 0       | 159       | 11        | 1,742          |
| Hancock      | 0                                     | 60      | 0                            | 0     | 13                                           | 0   | 0     | 0   | 13        | 13        | 28                   | 0       | 59        | 15        | 72             |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 127                  | 26      | 86        | 14        | 86             |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 0                    | 0       | 36        | 9         | 36             |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 60                   | 0       | 10        | 5         | 10             |
| Oxford       | 556                                   | 30      | 0                            | 0     | 436                                          | 0   | 512   | 0   | 948       | 17        | 35                   | 15      | 36        | 7         | 984            |
| Penobscot    | 100                                   | 333     | 1                            | 112   | 415                                          | 0   | 0     | 0   | 415       | 38        | 18                   | 4       | 69        | 9         | 484            |
| Piscataquis  | 967                                   | 0       | 0                            | 0     | 548                                          | 658 | 167   | 85  | 1,458     | 29        | 4                    | 36      | 136       | 12        | 1,594          |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 35                   | 0       | 0         | 0         | 0              |
| Somerset     | 104                                   | 17      | 0                            | 0     | 5,099                                        | 0   | 99    | 454 | 5,652     | 23        | 42                   | 137     | 131       | 13        | 5,783          |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 10                   | 0       | 129       | 14        | 129            |
| Washington   | 270                                   | 0       | 2                            | 242   | 97                                           | 91  | 571   | 157 | 916       | 21        | 0                    | 1       | 62        | 12        | 978            |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 10                   | 29      | 23        | 12        | 23             |
| State Total: | 3,444                                 | 2,599   | 3                            | 354   | 10,674                                       | 749 | 1,635 | 707 | 13,765    | 24        | 442                  | 253     | 1,101     | 12        | 14,866         |

### Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

### Frequency Distribution of Clearcutting for Large Landowners who own more than 100,000 acres

2008 Clearcut as  
percent of statewide

| <u>ownership</u>    | <u># of Landowners</u> | <u>Clearcut Acres</u> |
|---------------------|------------------------|-----------------------|
| <b>0% - 0.001%</b>  | <b>6</b>               | <b>3,648</b>          |
| <b>0.001%-0.25%</b> | <b>9</b>               | <b>3,719</b>          |
| <b>0.26%-0.75%</b>  | <b>2</b>               | <b>6,398</b>          |
| <b>0.76%-1.00%</b>  | <b>0</b>               | <b>0</b>              |



**2010**

# **Silvicultural Activities Report**

**including Annual Report on Clearcutting and Precommercial Activities**

Compiled from the 2010 Landowner Reports and other survey instruments.  
Data collected under the provisions of Title 12 MRSA §8885 and §8878-A

**Published:  
December 22, 2011**



**Department of Conservation  
Maine Forest Service  
Forest Policy and Management Division  
#22 SHS, Augusta, ME 04333  
(207)287-2791 OR 1-800-367-0223(instate)  
[www.maineforestservice.gov](http://www.maineforestservice.gov); [www.bewoodswise.org](http://www.bewoodswise.org)  
*We help you make informed decisions about Maine's forests.*  
This publication is available online at:[www.maineforestservice.gov](http://www.maineforestservice.gov)**

## Report Highlights

### Harvesting and Land Use Changes

- 442,707 acres were harvested in 2010, a 12% increase from 395,913 acres in 2009.
- 420,309 acres were "partially harvested" (partial and shelterwood totals) in 2010, a 12% increase from 376,765 acres in 2009.
- The number of harvests reported increased from 4,864 to 5,650.

#### Clearcutting:

1. The total area clearcut increased, from 14,877 acres in 2009 to 19,292 acres in 2010. Clearcutting amounts to just over 4% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 92% of all clearcuts (17,732 acres).
3. Average clearcut size in 2010 was 19 acres. Landowners owning more than 100,000 acres had an average clearcut size of 20 acres. Landowners owning less than 100,000 acres had an average clearcut size of 11 acres. One clearcut larger than 75 acres was created in 2010.
4. The primary silvicultural reason for clearcutting reported by large landowners was the removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use decreased 27% from 4,271 acres in 2009 to 3,106 acres in 2010.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation increased 909%, from 22 acres in 2009 to 222 acres in 2010.
- To release crop trees from competing vegetation decreased 27%, from 10,892 acres in 2009 to 7,963 acres in 2010.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws increased 51%, from 4,080 acres in 2009 to 6,175 acres in 2010.
- 95% of this activity was done by landowners owning more than 100,000 acres (5,868 acres).

#### Planting:

- Tree planting decreased 28%, from 2,852 acres in 2009 to 2,067 acres in 2010.
- 98% of the planting was by landowners owning more than 100,000 acres (2,020 acres).

### Forester Involvement

- In 2010, licensed foresters supervised harvesting on 304,169 acres, compared to 270,015 acres in 2009.
- 69% of all harvest acres in 2010 had a licensed forester involved; a slight increase from 2009 (68%).
- Licensed Forester supervision occurred on 25% (594 out of 2,338 harvests) of the harvests on family forests (<= 100 acres) in 2010. This is a slight increase from 24% in 2009 (563 out of 2,315 harvests).

## 2010 Harvesting and Land Use Changes

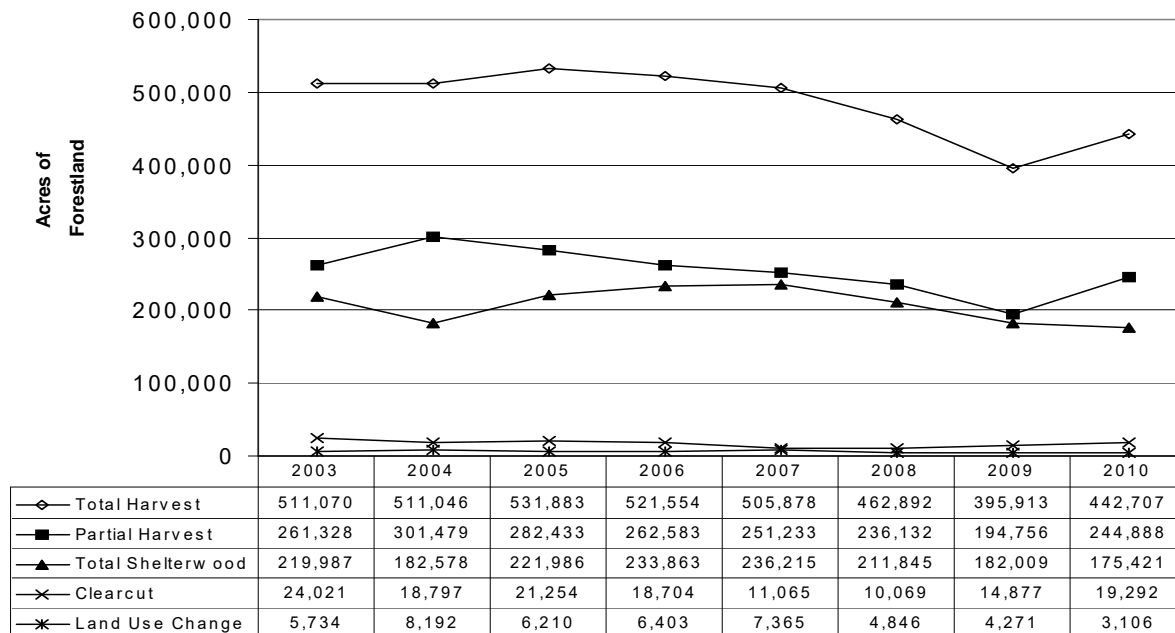
| Commercial Harvest Information by Landowner Size and Type |                        | Acres            |                               |             |                   |          |                 |               |
|-----------------------------------------------------------|------------------------|------------------|-------------------------------|-------------|-------------------|----------|-----------------|---------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |             |                   | Clearcut | Land Use Change | Total Harvest |
|                                                           |                        |                  | Initial or Intermediate Entry | Final Entry | Total Shelterwood |          |                 |               |
| OwnershipType                                             | Ownership Size         |                  |                               |             |                   |          |                 |               |
| Forest Industry Woodlands                                 | 1 to 100 acres         | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 101 to 1,000 acres     | 40               | 0                             | 0           | 0                 | 0        | 0               | 40            |
|                                                           | 1,001 to 100,000 acres | 1,509            | 375                           | 76          | 451               | 0        | 0               | 1,960         |
|                                                           | 100,000 + acres        | 14,761           | 14,962                        | 23,978      | 38,940            | 2,980    | 0               | 56,681        |
|                                                           | SubTotal               | 16,310           | 15,337                        | 24,054      | 39,391            | 2,980    | 0               | 58,681        |
| Investor Timberlands                                      | 1 to 100 acres         | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 101 to 1,000 acres     | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 1,001 to 100,000 acres | 491              | 772                           | 903         | 1,675             | 26       | 0               | 2,192         |
|                                                           | 100,000 + acres        | 25,042           | 25,409                        | 33,846      | 59,255            | 9,343    | 0               | 93,640        |
|                                                           | SubTotal               | 25,533           | 26,181                        | 34,749      | 60,930            | 9,369    | 0               | 95,832        |
| Non-Industrial Land                                       | 1 to 100 acres         | 36,334           | 2,667                         | 2,840       | 5,507             | 491      | 1,182           | 43,514        |
|                                                           | 101 to 1,000 acres     | 71,372           | 4,633                         | 6,266       | 10,899            | 754      | 1,115           | 84,140        |
|                                                           | 1,001 to 100,000 acres | 43,858           | 4,234                         | 9,907       | 14,141            | 284      | 274             | 58,557        |
|                                                           | 100,000 + acres        | 37,507           | 22,971                        | 19,325      | 42,296            | 5,401    | 374             | 85,578        |
|                                                           | SubTotal               | 189,071          | 34,505                        | 38,338      | 72,843            | 6,930    | 2,945           | 271,789       |
| Other Woodlands (Govt, etc.)                              | 1 to 100 acres         | 112              | 0                             | 10          | 10                | 0        | 4               | 126           |
|                                                           | 101 to 1,000 acres     | 1,770            | 169                           | 184         | 353               | 0        | 68              | 2,191         |
|                                                           | 1,001 to 100,000 acres | 848              | 467                           | 494         | 961               | 5        | 89              | 1,903         |
|                                                           | 100,000 + acres        | 11,244           | 377                           | 556         | 933               | 8        | 0               | 12,185        |
|                                                           | SubTotal               | 13,974           | 1,013                         | 1,244       | 2,257             | 13       | 161             | 16,405        |
| 2010 Totals:                                              |                        | 244,888          | 77,036                        | 98,385      | 175,421           | 19,292   | 3,106           | 442,707       |
| Percent of 2010 Harvest:                                  |                        | 55.32%           | 17.40%                        | 22.22%      | 39.62%            | 4.36%    | 0.70%           | 100.00%       |
| 2009 Totals:                                              |                        | 194,756          | 86,773                        | 95,236      | 182,009           | 14,877   | 4,271           | 395,913       |
| Percent Change from 2009 to 2010:                         |                        | 26%              | -11%                          | 3%          | -4%               | 30%      | -27%            | 12%           |

## 2010 Precommercial Activities and Professional Assistance

| OwnershipTypeOwnership Size  |                        | Precommercial Activities<br>by Landowner Size and Type |         |       |                  |  | Number<br>of<br>Reported<br>Harvests | Licensed Forester<br>Involvement<br>by Landowner Size and Type |                |
|------------------------------|------------------------|--------------------------------------------------------|---------|-------|------------------|--|--------------------------------------|----------------------------------------------------------------|----------------|
|                              |                        | Acres                                                  |         |       |                  |  |                                      | Number of<br>Harvests                                          | Total<br>Acres |
|                              |                        | Herbicide Use                                          |         | TSI   | Tree<br>Planting |  |                                      |                                                                |                |
|                              |                        | Site Prep                                              | Release |       |                  |  |                                      |                                                                |                |
| Forest Industry Woodlands    | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 0                                    | 0                                                              | 0              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                |  | 2                                    | 0                                                              | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 0                |  | 26                                   | 23                                                             | 1,655          |
|                              | 100,000 + acres        | 0                                                      | 5,952   | 3,598 | 1,706            |  | 123                                  | 140                                                            | 40,926         |
|                              | Subtotal               | 0                                                      | 5,952   | 3,598 | 1,706            |  | 151                                  | 163                                                            | 42,581         |
| Investor Timberlands         | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 0                                    | 0                                                              | 0              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                |  | 0                                    | 0                                                              | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 0                |  | 7                                    | 6                                                              | 1,792          |
|                              | 100,000 + acres        | 0                                                      | 1,355   | 2,270 | 314              |  | 226                                  | 213                                                            | 85,818         |
|                              | Subtotal               | 0                                                      | 1,355   | 2,270 | 314              |  | 233                                  | 219                                                            | 87,610         |
| Non-Industrial Land          | 1 to 100 acres         | 0                                                      | 35      | 90    | 35               |  | 2,327                                | 589                                                            | 13,510         |
|                              | 101 to 1,000 acres     | 0                                                      | 139     | 212   | 12               |  | 2,072                                | 641                                                            | 29,066         |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 0                |  | 466                                  | 263                                                            | 36,464         |
|                              | 100,000 + acres        | 217                                                    | 462     | 0     | 0                |  | 262                                  | 232                                                            | 80,135         |
|                              | Subtotal               | 217                                                    | 636     | 302   | 47               |  | 5,127                                | 1,725                                                          | 159,175        |
| Other Woodlands (Govt, etc.) | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 11                                   | 5                                                              | 76             |
|                              | 101 to 1,000 acres     | 5                                                      | 20      | 5     | 0                |  | 46                                   | 29                                                             | 1,317          |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 0                |  | 22                                   | 17                                                             | 1,814          |
|                              | 100,000 + acres        | 0                                                      | 0       | 0     | 0                |  | 60                                   | 57                                                             | 11,596         |
|                              | Subtotal               | 5                                                      | 20      | 5     | 0                |  | 139                                  | 108                                                            | 14,803         |
| 2010 Totals:                 |                        | 222                                                    | 7,963   | 6,175 | 2,067            |  | 5,650                                | 2,215                                                          | 304,169        |
| 2009 Totals:                 |                        | 22                                                     | 10,892  | 4,080 | 2,852            |  | 4,864                                | 1,966                                                          | 270,015        |
| Change from 2009 to 2010:    |                        | 909%                                                   | -27%    | 51%   | -28%             |  | 16%                                  | 13%                                                            | 13%            |

**Definitions:**

- Ownership Type**
- Forest Industry Land:** Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.
- Investor Timberlands** Woodlands owned by organizations, including Timberland Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs) that hold timberland assets as fiduciaries for the benefit of others.
- Non-Industrial Land:** Woodlands privately owned but NOT by a forest industry. These include private individuals and other non-forest product industries.
- Other woodlands:** Woodlands owned by other entities not listed above -- including local, state, federal, or tribal governments.
- Types of Harvests**
- Partial Harvest:** Harvest where trees are removed individually or in small (<5 acre) patches.
- Shelterwood:** Harvest of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.
- Clearcut:** Harvest on a site larger than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Service Rules Chapter 20 for additional information. It can be found on the Maine Forest Service website at [http://www.state.me.us/doc/mfs/rules\\_regs/index.htm](http://www.state.me.us/doc/mfs/rules_regs/index.htm)
- Change of Land Use:** Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.

**Harvesting Trends in Maine 2003-2010**



# 2010 Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2010 Landowner Reports and other survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRSA § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |   |       |     |           |           | All Other Landowners |         |           |           | All Landowners |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|---|-------|-----|-----------|-----------|----------------------|---------|-----------|-----------|----------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |   |       |     |           |           | <u>Acres</u>         |         |           |           |                |
|              | <u>Acres</u>                          |         | #                            | Acres | 1                                            | 2 | 3     | 4   | Sub Total | Avg. Size | TSI                  | Planted | Clearcut  |           |                |
|              | TSI                                   | Planted |                              |       |                                              |   |       |     |           |           |                      |         | Sub Total | Avg. Size |                |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 15                   | 0       | 5         | 5         | 5              |
| Aroostook    | 2,935                                 | 1,741   | 0                            | 0     | 2,435                                        | 0 | 703   | 0   | 3,138     | 29        | 12                   | 0       | 396       | 12        | 3,534          |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 5                    | 0       | 15        | 8         | 15             |
| Franklin     | 0                                     | 0       | 0                            | 0     | 1,714                                        | 0 | 386   | 0   | 2,100     | 24        | 20                   | 0       | 22        | 8         | 2,122          |
| Hancock      | 0                                     | 0       | 0                            | 0     | 6                                            | 0 | 0     | 0   | 6         | 6         | 21                   | 0       | 83        | 14        | 89             |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 13                                           | 0 | 0     | 0   | 13        | 13        | 18                   | 4       | 9         | 4         | 22             |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 0                    | 0       | 52        | 9         | 52             |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 0                    | 0       | 8         | 4         | 8              |
| Oxford       | 429                                   | 0       | 1                            | 130   | 2,443                                        | 0 | 1,895 | 0   | 4,338     | 16        | 10                   | 1       | 73        | 7         | 4,411          |
| Penobscot    | 289                                   | 191     | 0                            | 0     | 302                                          | 0 | 0     | 0   | 302       | 34        | 178                  | 10      | 148       | 11        | 450            |
| Piscataquis  | 1,933                                 | 88      | 0                            | 0     | 389                                          | 0 | 296   | 168 | 853       | 21        | 3                    | 20      | 190       | 13        | 1,043          |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 0                    | 0       | 5         | 5         | 5              |
| Somerset     | 282                                   | 0       | 0                            | 0     | 6,276                                        | 0 | 258   | 231 | 6,765     | 18        | 5                    | 7       | 204       | 10        | 6,969          |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 0                    | 5       | 86        | 17        | 86             |
| Washington   | 0                                     | 0       | 0                            | 0     | 195                                          | 0 | 0     | 22  | 217       | 13        | 15                   | 0       | 110       | 10        | 327            |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0 | 0     | 0   | 0         | 0         | 5                    | 0       | 154       | 14        | 154            |
| State Total: | 5,868                                 | 2,020   | 1                            | 130   | 13,773                                       | 0 | 3,538 | 421 | 17,732    | 20        | 307                  | 47      | 1,560     | 11        | 19,292         |

## Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

## Frequency Distribution of Clearcutting for Large Landowners who own more than 100,000 acres

2010 Clearcut as  
percent of statewide  
ownership

# of Landowners

Clearcut Acres

**0% - 0.001%**

**2**

**135**

**0.001%-0.25%**

**14**

**12,448**

**0.26%-0.75%**

**1**

**5,149**

**0.76%-1.00%**

**0**

**0**

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## Maine Forest Service District Foresters

### Dennis Brennan

2281 Alfred Road  
Lyman, ME 04002  
Phone: (207) 592-1251  
E-mail: dennis.brennan@maine.gov

### Morten Moesswilde

536 Waldoboro Road  
Jefferson, ME 04348  
Phone: (207) 441-2895  
E-mail: morten.moesswilde@maine.gov

### Steve MacDonald

P.O. Box 130  
Jonesboro, ME 04468  
Phone: (207) 441-4924  
E-mail: stephen.macdonald@maine.gov

### Jim Ecker

P.O. Box 415  
Old Town, ME 04468  
Phone: (207) 441-4308  
E-mail: jim.ecker@maine.gov

### Dan Jacobs

2 Forestry Road  
Island Falls, ME 04747  
Phone: (207) 441-4128  
E-mail: dan.jacobs@maine.gov

### Ken Canfield

356 Shaker Road  
Gray, ME 04039  
Phone: (207) 441-3712  
E-mail: ken.canfield@maine.gov

### Patty Cormier

PO Box 416  
Norridgewock, ME 04957  
Phone: (207) 592-2238  
E-mail: patty.cormier@maine.gov

### Gordon Moore

P.O. Box 1107  
Greenville, ME 04441  
Phone: (207) 441-4139  
E-mail: gordon.moore@maine.gov

### Merle Ring

131 Bethel Road  
West Paris, ME 04289  
Phone: (207) 441-3276  
E-mail: merle.ring@maine.gov

### Dave Rochester

45 Radar Road  
Ashland, ME 04732  
Phone: (207) 441-3817  
E-mail: dave.rochester@maine.gov

**Maine Forest Service - Main Office - Augusta** 1-800-367-0223 (instate) or 207-287-2791  
email: forestinfo@maine.gov

# 2011

## Silvicultural Activities Report

**including Annual Report on Clearcutting and Precommercial Activities**

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Data collected under the provisions of Title 12 MRSA §8885 and §8878-A

**Published:**  
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**Department of Agriculture, Conservation and Forestry**  
**Maine Forest Service**  
**Forest Policy and Management Division**  
**#22 SHS, Augusta, ME 04333**  
**(207)287-2791 OR 1-800-367-0223(instate)**  
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**This publication is available online at:[www.maineforestservice.gov](http://www.maineforestservice.gov)**  
Printed under appropriation 010-04A-5400-51

## Report Highlights

### Harvesting and Land Use Changes

- 444,339 acres were harvested in 2011, a slight increase from 443,169 acres in 2010.
- 414,667 acres were "partially harvested" (partial and shelterwood totals) in 2011, a -1% decrease from 420,689 acres in 2010.
- The number of harvests reported increased to 5,759 from 5,663.

#### Clearcutting:

1. The total area clearcut increased, from 19,301 acres in 2010 to 24,463 acres in 2011. Clearcutting amounted to 5.5% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 94% of all clearcuts (22,945 acres).
3. Average clearcut size in 2011 was 23 acres. Landowners owning more than 100,000 acres had an average clearcut size of 36 acres. Landowners owning less than 100,000 acres had an average clearcut size of 14 acres. 16 clearcuts larger than 75 acres were created in 2011.
4. The primary silvicultural reason for clearcutting reported by large landowners was the removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use increased 64% from 3,179 acres in 2010 to 5,209 acres in 2011.
- The increase in harvested acres for land use change under the Other Woodlands ownership type is associated with the Central Maine Power transmission project.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation increased 666%, from 222 acres in 2010 to 1,701 acres in 2011.
- To release crop trees from competing vegetation decreased 8%, from 7,963 acres in 2010 to 7,298 acres in 2011.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws increased 10%, from 6,175 acres in 2010 to 6,765 acres in 2011.
- 91% of this activity was done by landowners owning more than 100,000 acres (6,188 acres).

#### Planting:

- Tree planting increased 105%, from 2,067 acres in 2010 to 4,238 acres in 2011.
- 97% of the planting was by landowners owning more than 100,000 acres (4,093 acres).

### Forester Involvement

- In 2011, licensed foresters supervised harvesting on 326,277 acres, compared to 304,299 acres in 2010.
- 73% of all harvest acres in 2011 had a licensed forester involved; a slight increase from 2010 (68%).
- Licensed Forester supervision occurred on 23% (665 out of 2,880 harvests) of the harvests on family forests ( $\leq 100$  acres) in 2011. This is a slight decrease from 25% in 2010 (588 out of 2,339 harvests).



## 2011 Harvesting and Land Use Changes

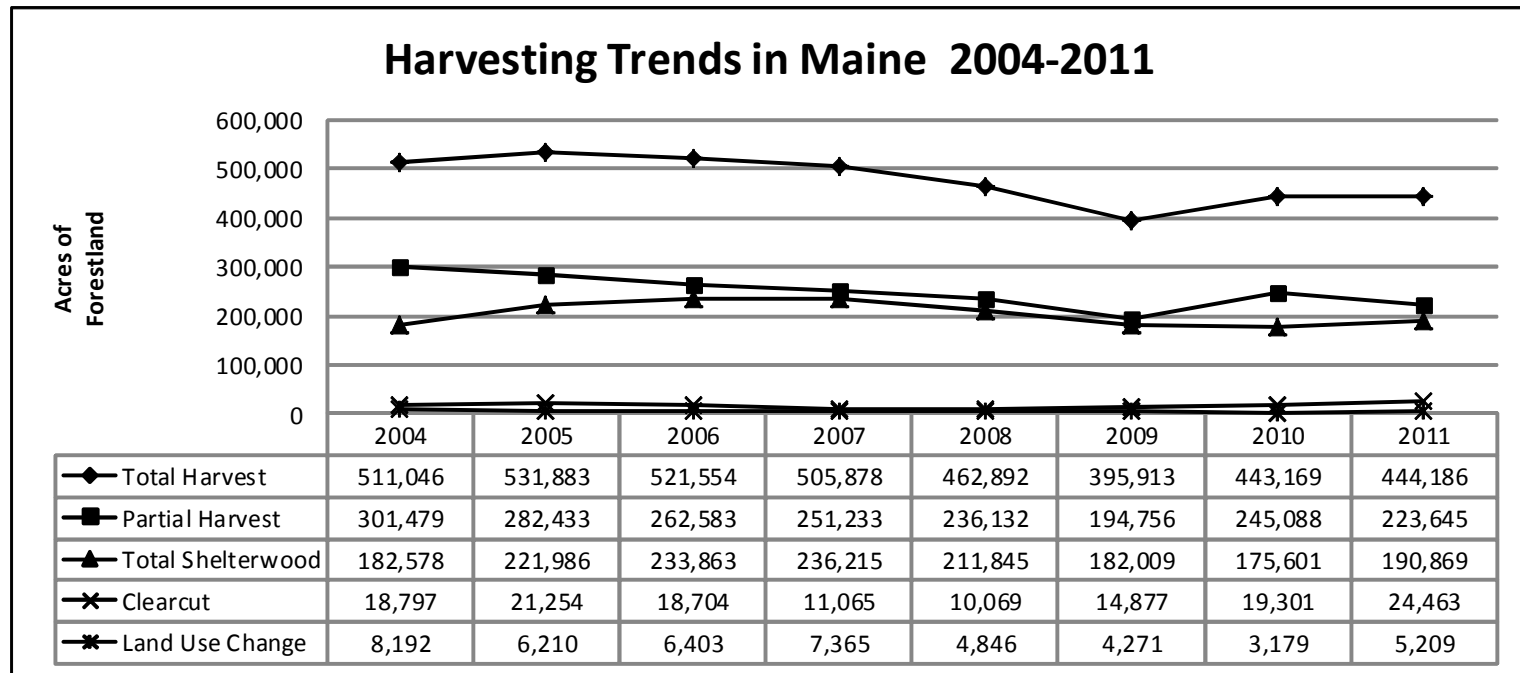
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|-----------------------------------------------------------|------------------------|------------------|-------------------------------|-------------|-------------------|----------|-----------------|---------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |             |                   | Clearcut | Land Use Change | Total Harvest |
|                                                           |                        |                  | Initial or Intermediate Entry | Final Entry | Total Shelterwood |          |                 |               |
| OwnershipType                                             | Ownership Size         |                  |                               |             |                   |          |                 |               |
| Forest Industry Woodlands                                 | 1 to 100 acres         | 25               | 0                             | 0           | 0                 | 14       | 14              | 53            |
|                                                           | 101 to 1,000 acres     | 90               | 15                            | 70          | 85                | 0        | 10              | 185           |
|                                                           | 1,001 to 100,000 acres | 2,777            | 23                            | 167         | 190               | 0        | 16              | 2,983         |
|                                                           | 100,000 + acres        | 14,562           | 11,770                        | 24,178      | 35,948            | 6,105    | 61              | 56,676        |
|                                                           | SubTotal               | 17,454           | 11,808                        | 24,415      | 36,223            | 6,119    | 101             | 59,897        |
| Investor Timberlands                                      | 1 to 100 acres         | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 101 to 1,000 acres     | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 1,001 to 100,000 acres | 899              | 236                           | 849         | 1,085             | 102      | 1               | 2,087         |
|                                                           | 100,000 + acres        | 21,909           | 24,122                        | 32,429      | 56,551            | 9,981    | 0               | 88,441        |
|                                                           | SubTotal               | 22,808           | 24,358                        | 33,278      | 57,636            | 10,083   | 1               | 90,528        |
| Non-Industrial Land                                       | 1 to 100 acres         | 50,728           | 2,518                         | 3,612       | 6,130             | 474      | 1,536           | 58,868        |
|                                                           | 101 to 1,000 acres     | 65,253           | 4,569                         | 5,035       | 9,604             | 557      | 794             | 76,208        |
|                                                           | 1,001 to 100,000 acres | 33,346           | 8,978                         | 13,794      | 22,772            | 311      | 354             | 56,783        |
|                                                           | 100,000 + acres        | 20,594           | 34,256                        | 20,896      | 55,152            | 6,859    | 448             | 83,053        |
|                                                           | SubTotal               | 169,921          | 50,321                        | 43,337      | 93,658            | 8,201    | 3,132           | 274,912       |
| Other Woodlands (Govt, etc.)                              | 1 to 100 acres         | 107              | 20                            | 0           | 20                | 0        | 46              | 173           |
|                                                           | 101 to 1,000 acres     | 2,199            | 187                           | 101         | 288               | 5        | 15              | 2,507         |
|                                                           | 1,001 to 100,000 acres | 1,090            | 554                           | 936         | 1,490             | 55       | 1,870           | 4,505         |
|                                                           | 100,000 + acres        | 10,219           | 419                           | 1,135       | 1,554             | 0        | 44              | 11,817        |
|                                                           | SubTotal               | 13,615           | 1,180                         | 2,172       | 3,352             | 60       | 1,975           | 19,002        |
| 2011 Totals:                                              |                        | 223,798          | 87,667                        | 103,202     | 190,869           | 24,463   | 5,209           | 444,339       |
| Percent of 2011 Harvest:                                  |                        | 50.37%           | 19.73%                        | 23.23%      | 42.96%            | 5.51%    | 1.17%           | 100.00%       |
| 2010 Totals:                                              |                        | 245,088          | 77,206                        | 98,395      | 175,601           | 19,301   | 3,179           | 443,169       |
| Percent Change from 2010 to 2011:                         |                        | -9%              | 14%                           | 5%          | 9%                | 27%      | 64%             | 0%            |

## 2011 Precommercial Activities and Professional Assistance

| OwnershipTypeOwnership Size  |                        | Precommercial Activities<br>by Landowner Size and Type |         |       |                  |  | Number<br>of<br>Reported<br>Harvests | Licensed Forester<br>Involvement |                |
|------------------------------|------------------------|--------------------------------------------------------|---------|-------|------------------|--|--------------------------------------|----------------------------------|----------------|
|                              |                        | Acres                                                  |         |       |                  |  |                                      | by Landowner Size and Type       |                |
|                              |                        | Herbicide Use                                          |         | TSI   | Tree<br>Planting |  |                                      | Number of<br>Harvests            | Total<br>Acres |
|                              |                        | Site Prep                                              | Release |       |                  |  |                                      |                                  |                |
| Forest Industry Woodlands    | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 2                                    | 1                                | 28             |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                |  | 3                                    | 2                                | 150            |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 0                |  | 28                                   | 21                               | 2,076          |
|                              | 100,000 + acres        | 0                                                      | 5,277   | 2,163 | 3,144            |  | 100                                  | 96                               | 56,678         |
|                              | Subtotal               | 0                                                      | 5,277   | 2,163 | 3,144            |  | 133                                  | 120                              | 58,932         |
| Investor Timberlands         | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 0                                    | 0                                | 0              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                |  | 0                                    | 0                                | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 0                |  | 8                                    | 8                                | 2,087          |
|                              | 100,000 + acres        | 0                                                      | 820     | 2,159 | 429              |  | 191                                  | 189                              | 86,713         |
|                              | Subtotal               | 0                                                      | 820     | 2,159 | 429              |  | 199                                  | 197                              | 88,800         |
| Non-Industrial Land          | 1 to 100 acres         | 10                                                     | 23      | 271   | 67               |  | 2,885                                | 667                              | 15,971         |
|                              | 101 to 1,000 acres     | 5                                                      | 4       | 241   | 26               |  | 1,672                                | 611                              | 31,034         |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 65    | 52               |  | 385                                  | 244                              | 32,217         |
|                              | 100,000 + acres        | 381                                                    | 1,174   | 1,857 | 520              |  | 271                                  | 250                              | 81,118         |
|                              | Subtotal               | 396                                                    | 1,201   | 2,434 | 665              |  | 5,213                                | 1,772                            | 160,340        |
| Other Woodlands (Govt, etc.) | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 15                                   | 8                                | 117            |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                |  | 50                                   | 33                               | 2,024          |
|                              | 1,001 to 100,000 acres | 1,305                                                  | 0       | 0     | 0                |  | 82                                   | 73                               | 4,255          |
|                              | 100,000 + acres        | 0                                                      | 0       | 9     | 0                |  | 72                                   | 70                               | 11,809         |
|                              | Subtotal               | 1,305                                                  | 0       | 9     | 0                |  | 219                                  | 184                              | 18,205         |
| 2011 Totals:                 |                        | 1,701                                                  | 7,298   | 6,765 | 4,238            |  | 5,764                                | 2,273                            | 326,277        |
| 2010 Totals:                 |                        | 222                                                    | 7,963   | 6,175 | 2,067            |  | 5,663                                | 2,190                            | 304,299        |
| Change from 2010 to 2011:    |                        | 666%                                                   | -8%     | 10%   | 105%             |  | 2%                                   | 4%                               | 7%             |

**Definitions:**

|                                |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|--------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><u>Ownership Type</u></b>   | <b><i>Forest Industry Land:</i></b> Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                | <b><i>Investor Timberlands</i></b> Woodlands owned by organizations, including Timberland Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs) that hold timberland assets as fiduciaries for the benefit of others.                                                                                                                                                                                                                                                                                                                                                                                 |
|                                | <b><i>Non-Industrial Land:</i></b> Woodlands privately owned but NOT by a forest industry. These include private individuals and other non-forest product industries.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                | <b><i>Other woodlands:</i></b> Woodlands owned by other entities not listed above -- including local, state, federal, or tribal governments.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b><u>Types of Harveys</u></b> | <b><i>Partial Harvest:</i></b> Harvest where trees are removed individually or in small (<5 acre) patches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                | <b><i>Shelterwood:</i></b> Harvest of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.                                                                                                                                                                                                                                                                                                                                                                                 |
|                                | <b><i>Clearcut:</i></b> Harvest on a site larger than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Service Rules Chapter 20 for additional information. It can be found on the Maine Forest Service website at <a href="http://www.state.me.us/doc/mfs/rules_regs/index.htm">http://www.state.me.us/doc/mfs/rules_regs/index.htm</a> |
|                                | <b><i>Change of Land Use:</i></b> Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |



# 2011 Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2011 Landowner Reports and other survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRSA § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |    |       |     |           |           | All Other Landowners |         |           |           | All Landowners           |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|----|-------|-----|-----------|-----------|----------------------|---------|-----------|-----------|--------------------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |    |       |     |           |           | <u>Acres</u>         |         |           |           |                          |
|              | <u>Acres</u>                          |         | #                            | Acres | 1                                            | 2  | 3     | 4   | Sub Total | Avg. Size | TSI                  | Planted | Clearcut  |           | <u>Acres</u><br>Clearcut |
|              | TSI                                   | Planted |                              |       |                                              |    |       |     |           |           |                      |         | Sub Total | Avg. Size |                          |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 9                    | 0       | 35        | 7         | 35                       |
| Aroostook    | 2,102                                 | 3,421   | 4                            | 558   | 5,856                                        | 0  | 77    | 97  | 6,030     | 35        | 26                   | 22      | 324       | 14        | 6,354                    |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 10                   | 6       | 16        | 8         | 16                       |
| Franklin     | 0                                     | 0       | 4                            | 567   | 1,199                                        | 0  | 780   | 0   | 1,979     | 22        | 85                   | 1       | 35        | 18        | 2,014                    |
| Hancock      | 0                                     | 0       | 1                            | 233   | 312                                          | 0  | 0     | 0   | 312       | 104       | 50                   | 0       | 88        | 8         | 400                      |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 71                   | 3       | 76        | 38        | 76                       |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 0                    | 0       | 167       | 12        | 167                      |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 120                  | 0       | 28        | 9         | 28                       |
| Oxford       | 465                                   | 0       | 6                            | 869   | 2,490                                        | 0  | 1,687 | 0   | 4,177     | 20        | 5                    | 0       | 216       | 14        | 4,393                    |
| Penobscot    | 689                                   | 142     | 0                            | 0     | 721                                          | 0  | 28    | 20  | 769       | 28        | 23                   | 41      | 48        | 8         | 817                      |
| Piscataquis  | 951                                   | 40      | 0                            | 0     | 2,631                                        | 0  | 301   | 317 | 3,249     | 26        | 10                   | 5       | 156       | 14        | 3,405                    |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 0                    | 0       | 10        | 10        | 10                       |
| Somerset     | 1,566                                 | 490     | 0                            | 0     | 5,532                                        | 0  | 63    | 311 | 5,906     | 20        | 56                   | 44      | 153       | 15        | 6,059                    |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 127 | 127       | 25        | 30                   | 15      | 75        | 15        | 202                      |
| Washington   | 415                                   | 0       | 1                            | 105   | 106                                          | 50 | 135   | 105 | 396       | 40        | 44                   | 7       | 20        | 10        | 416                      |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 38                   | 1       | 71        | 24        | 71                       |
| State Total: | 6,188                                 | 4,093   | 16                           | 2,332 | 18,847                                       | 50 | 3,071 | 977 | 22,945    | 36        | 577                  | 145     | 1,518     | 14        | 24,463                   |

## Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

## Frequency Distribution of Clearcutting for Large Landowners who own more than 100,000 acres

2011 Clearcut as  
percent of statewide  
ownership

# of Landowners

Clearcut Acres

**0% - 0.001%**

**3**

**528**

**0.001%-0.25%**

**5**

**4,852**

**0.26%-0.75%**

**10**

**9,019**

**0.76%-1.00%**

**2**

**8,546**

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## Maine Forest Service District Foresters

### Ken Canfield

2281 Alfred Road  
Lyman, ME 04002  
Phone: (207) 441-3712  
E-mail: ken.canfield@maine.gov

### Morten Moesswilde

536 Waldoboro Road  
Jefferson, ME 04348  
Phone: (207) 441-2895  
E-mail: morten.moesswilde@maine.gov

### Steve MacDonald

P.O. Box 130  
Jonesboro, ME 04468  
Phone: (207) 441-4924  
E-mail: stephen.macdonald@maine.gov

### Jim Ecker

P.O. Box 415  
Old Town, ME 04468  
Phone: (207) 441-4308  
E-mail: jim.ecker@maine.gov

### Dan Jacobs

2 Forestry Road  
Island Falls, ME 04747  
Phone: (207) 441-4128  
E-mail: dan.jacobs@maine.gov

### Shane Duigan

356 Shaker Road  
Gray, ME 04039  
Phone: (207) 592-1251  
E-mail: shane.p.duigan@maine.gov

### Patty Cormier

PO Box 416  
Norridgewock, ME 04957  
Phone: (207) 592-2238  
E-mail: patty.cormier@maine.gov

### Gordon Moore

P.O. Box 1107  
Greenville, ME 04441  
Phone: (207) 441-4139  
E-mail: gordon.moore@maine.gov

### Merle Ring

131 Bethel Road  
West Paris, ME 04289  
Phone: (207) 441-3276  
E-mail: merle.ring@maine.gov

### Dave Rochester

45 Radar Road  
Ashland, ME 04732  
Phone: (207) 441-3817  
E-mail: dave.rochester@maine.gov

**Maine Forest Service - Main Office - Augusta** 1-800-367-0223 (instate) or 207-287-2791  
email: forestinfo@maine.gov

# 2012 Silvicultural Activities Report

## including Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2012 Landowner Reports and other survey instruments.  
Data collected under the provisions of Title 12 MRS §8885 and §8878-A

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**Department of Agriculture, Conservation and Forestry**

**Maine Forest Service**

**Forest Policy and Management Division**

**#22 SHS, Augusta, ME 04333**

**(207)287-2791 OR 1-800-367-0223(instate)**

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## Report Highlights

### Harvesting and Land Use Change

- 443,714 acres were harvested in 2012, a slight decrease from the 444,410 acres in 2011.
- 418,675 acres were "partially harvested" (partial and shelterwood totals) in 2012, a 1% increase from 414,707 acres in 2011.
- The number of harvests reported increased to 5,994 from 5,767.

#### Clearcutting:

1. The total area clearcut decreased, from 24,494 acres in 2011 to 20,461 acres in 2012. Clearcutting amounted to 4.6% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 92% of all clearcuts (18,805 acres).
3. Average clearcut size in 2012 was 20 acres. Landowners owning more than 100,000 acres had an average clearcut size of 36 acres. Landowners owning less than 100,000 acres had an average clearcut size of 14 acres. 12 clearcuts larger than 75 acres were created in 2012.
4. The primary silvicultural reason for clearcutting reported by large landowners was the removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use decreased 12% from 5,209 acres in 2011 to 4,578 acres in 2012.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation decreased 35%, from 1,701 acres in 2011 to 1,105 acres in 2012.
- To release crop trees from competing vegetation increased 30%, from 7,298 acres in 2011 to 9,507 acres in 2012.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws increased 30%, from 6,765 acres in 2011 to 8,802 acres in 2012.
- 86% of this activity was done by landowners owning more than 100,000 acres (7,604 acres).

#### Planting:

- Tree planting increased 75%, from 4,238 acres in 2011 to 7,417 acres in 2012.
- 98% of the planting was by landowners owning more than 100,000 acres (7,265 acres).

### Forester Involvement

- In 2012, licensed foresters supervised harvesting on 333,507 acres, compared to 326,318 acres in 2011.
- 75% of all harvest acres in 2012 had a licensed forester involved; a slight increase from 2011 (73%).
- Licensed Forester supervision occurred on 30% (749 out of 2,462 harvests) of the harvests on family forests ( $\leq 100$  acres) in 2012. This is a slight increase from 29% in 2011 (666 out of 2,274 harvests).

## 2012 Harvesting and Land Use Changes

| Commercial Harvest Information by Landowner Size and Type |                        | Acres            |                               |             |                   |          |                 |               |
|-----------------------------------------------------------|------------------------|------------------|-------------------------------|-------------|-------------------|----------|-----------------|---------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |             |                   | Clearcut | Land Use Change | Total Harvest |
|                                                           |                        |                  | Initial or Intermediate Entry | Final Entry | Total Shelterwood |          |                 |               |
| OwnershipType                                             | Ownership Size         |                  |                               |             |                   |          |                 |               |
| Forest Industry Woodlands                                 | 1 to 100 acres         | 30               | 0                             | 0           | 0                 | 0        | 2               | 32            |
|                                                           | 101 to 1,000 acres     | 84               | 15                            | 50          | 65                | 0        | 0               | 149           |
|                                                           | 1,001 to 100,000 acres | 2,393            | 495                           | 73          | 568               | 0        | 32              | 2,993         |
|                                                           | 100,000 + acres        | 11,882           | 8,152                         | 13,117      | 21,269            | 2,481    | 0               | 35,632        |
|                                                           | SubTotal               | 14,389           | 8,662                         | 13,240      | 21,902            | 2,481    | 34              | 38,806        |
| Investor Timberlands                                      | 1 to 100 acres         | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 101 to 1,000 acres     | 110              | 0                             | 0           | 0                 | 0        | 0               | 110           |
|                                                           | 1,001 to 100,000 acres | 659              | 923                           | 94          | 1,017             | 0        | 0               | 1,676         |
|                                                           | 100,000 + acres        | 16,349           | 12,350                        | 24,076      | 36,426            | 6,012    | 3               | 58,790        |
|                                                           | SubTotal               | 17,118           | 13,273                        | 24,170      | 37,443            | 6,012    | 3               | 60,576        |
| Non-Industrial Land                                       | 1 to 100 acres         | 44,358           | 3,103                         | 3,334       | 6,437             | 518      | 1,378           | 52,691        |
|                                                           | 101 to 1,000 acres     | 71,276           | 4,076                         | 6,782       | 10,858            | 463      | 1,498           | 84,095        |
|                                                           | 1,001 to 100,000 acres | 30,717           | 8,631                         | 11,310      | 19,941            | 667      | 1,397           | 52,722        |
|                                                           | 100,000 + acres        | 37,090           | 45,583                        | 44,129      | 89,712            | 10,210   | 0               | 137,012       |
|                                                           | SubTotal               | 183,441          | 61,393                        | 65,555      | 126,948           | 11,858   | 4,273           | 326,520       |
| Other Woodlands (Govt, etc.)                              | 1 to 100 acres         | 158              | 0                             | 0           | 0                 | 0        | 22              | 180           |
|                                                           | 101 to 1,000 acres     | 1,740            | 110                           | 60          | 170               | 8        | 75              | 1,993         |
|                                                           | 1,001 to 100,000 acres | 1,784            | 842                           | 705         | 1,547             | 0        | 125             | 3,456         |
|                                                           | 100,000 + acres        | 10,689           | 477                           | 869         | 1,346             | 102      | 46              | 12,183        |
|                                                           | SubTotal               | 14,371           | 1,429                         | 1,634       | 3,063             | 110      | 268             | 17,812        |
| 2012 Totals:                                              |                        | 229,319          | 84,757                        | 104,599     | 189,356           | 20,461   | 4,578           | 443,714       |
| Percent of 2012 Harvest:                                  |                        | 51.68%           | 19.10%                        | 23.58%      | 42.68%            | 4.61%    | 1.03%           | 100.00%       |
| 2011 Totals:                                              |                        | 223,826          | 87,668                        | 103,213     | 190,881           | 24,494   | 5,209           | 444,410       |
| Percent Change from 2011 to 2012:                         |                        | 2%               | -3%                           | 1%          | -1%               | -16%     | -12%            | 0%            |

## 2012 Precommercial Activities and Professional Assistance

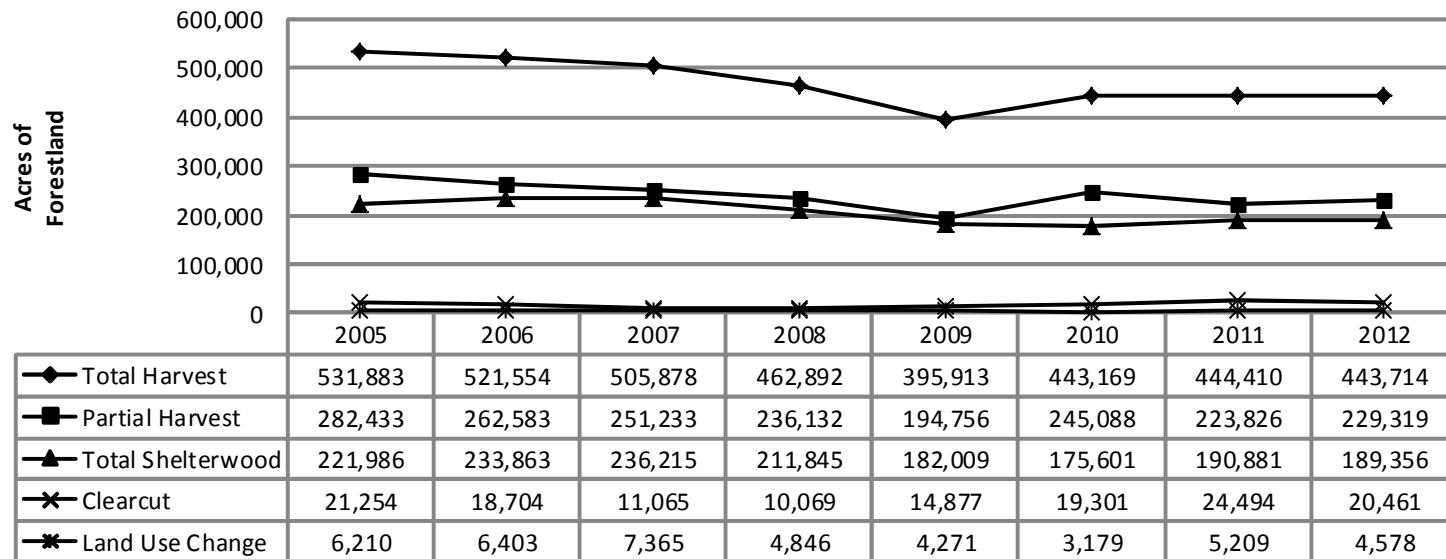
| OwnershipTypeOwnership Size  |                        | Precommercial Activities<br>by Landowner Size and Type |         |       |                  |  | Number<br>of<br>Reported<br>Harvests | Licensed Forester<br>Involvement |                |
|------------------------------|------------------------|--------------------------------------------------------|---------|-------|------------------|--|--------------------------------------|----------------------------------|----------------|
|                              |                        | Acres                                                  |         |       |                  |  |                                      | by Landowner Size and Type       |                |
|                              |                        | Herbicide Use                                          |         | TSI   | Tree<br>Planting |  |                                      | Number of<br>Harvests            | Total<br>Acres |
|                              |                        | Site Prep                                              | Release |       |                  |  |                                      |                                  |                |
| Forest Industry Woodlands    | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 2                                    | 1                                | 2              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                |  | 1                                    | 1                                | 99             |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 0                |  | 30                                   | 19                               | 2,131          |
|                              | 100,000 + acres        | 0                                                      | 5,096   | 0     | 6,319            |  | 115                                  | 106                              | 35,544         |
|                              | Subtotal               | 0                                                      | 5,096   | 0     | 6,319            |  | 148                                  | 127                              | 37,776         |
| Investor Timberlands         | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 0                                    | 0                                | 0              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                |  | 2                                    | 2                                | 105            |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 0                |  | 8                                    | 6                                | 1,451          |
|                              | 100,000 + acres        | 90                                                     | 2,251   | 1,822 | 0                |  | 139                                  | 139                              | 58,787         |
|                              | Subtotal               | 90                                                     | 2,251   | 1,822 | 0                |  | 149                                  | 147                              | 60,343         |
| Non-Industrial Land          | 1 to 100 acres         | 69                                                     | 7       | 255   | 61               |  | 2,662                                | 750                              | 17,284         |
|                              | 101 to 1,000 acres     | 33                                                     | 29      | 743   | 51               |  | 2,068                                | 693                              | 34,671         |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 20    | 40               |  | 452                                  | 274                              | 32,089         |
|                              | 100,000 + acres        | 880                                                    | 2,091   | 5,782 | 938              |  | 352                                  | 344                              | 135,357        |
|                              | Subtotal               | 982                                                    | 2,127   | 6,800 | 1,090            |  | 5,534                                | 2,061                            | 219,401        |
| Other Woodlands (Govt, etc.) | 1 to 100 acres         | 0                                                      | 0       | 95    | 0                |  | 11                                   | 1                                | 5              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 50    | 0                |  | 40                                   | 31                               | 1,669          |
|                              | 1,001 to 100,000 acres | 33                                                     | 33      | 35    | 0                |  | 35                                   | 28                               | 2,342          |
|                              | 100,000 + acres        | 0                                                      | 0       | 0     | 8                |  | 77                                   | 73                               | 11,971         |
|                              | Subtotal               | 33                                                     | 33      | 180   | 8                |  | 163                                  | 133                              | 15,987         |
|                              |                        |                                                        |         |       |                  |  |                                      |                                  |                |
| 2012 Totals:                 |                        | 1,105                                                  | 9,507   | 8,802 | 7,417            |  | 5,994                                | 2,468                            | 333,507        |
| 2011 Totals:                 |                        | 1,701                                                  | 7,298   | 6,765 | 4,238            |  | 5,767                                | 2,274                            | 326,318        |
| Change from 2011 to 2012:    |                        | -35%                                                   | 30%     | 30%   | 75%              |  | 4%                                   | 9%                               | 2%             |



**Definitions:**

- Ownership Type**
- Forest Industry Land:** Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.
- Investor Timberlands:** Woodlands owned by organizations, including Timberland Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs) that hold timberland assets as fiduciaries for the benefit of others.
- Non-Industrial Land:** Woodlands privately owned but NOT by a forest industry. These include private individuals and other non-forest product industries.
- Other woodlands:** Woodlands owned by other entities not listed above -- including local, state, federal, or tribal governments.
- Types of Harvests**
- Partial Harvest:** Harvest where trees are removed individually or in small (<5 acre) patches.
- Shelterwood:** Harvest of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.
- Clearcut:** Harvest on a site larger than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Service Rules Chapter 20 for additional information. It can be found on the Maine Forest Service website at [http://www.state.me.us/doc/mfs/rules\\_regs/index.htm](http://www.state.me.us/doc/mfs/rules_regs/index.htm)
- Change of Land Use:** Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.

### Harvesting Trends in Maine 2005-2012



# 2012 Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2012 Landowner Reports and other survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRS § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |    |       |     |           |           | All Other Landowners |         |           |           | All Landowners           |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|----|-------|-----|-----------|-----------|----------------------|---------|-----------|-----------|--------------------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |    |       |     |           |           | <u>Acres</u>         |         |           |           |                          |
|              | <u>Acres</u>                          |         | #                            | Acres | 1                                            | 2  | 3     | 4   | Sub Total | Avg. Size | TSI                  | Planted | Clearcut  |           | <u>Acres</u><br>Clearcut |
|              | TSI                                   | Planted |                              |       |                                              |    |       |     |           |           |                      |         | Sub Total | Avg. Size |                          |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 10                   | 15      | 15        | 8         | 15                       |
| Aroostook    | 2,877                                 | 6,113   | 0                            | 0     | 2,338                                        | 48 | 275   | 90  | 2,751     | 18        | 34                   | 16      | 310       | 15        | 3,061                    |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 15                   | 3       | 37        | 12        | 37                       |
| Franklin     | 747                                   | 13      | 4                            | 559   | 1,861                                        | 0  | 150   | 0   | 2,011     | 19        | 12                   | 1       | 22        | 6         | 2,033                    |
| Hancock      | 0                                     | 0       | 0                            | 0     | 189                                          | 0  | 0     | 0   | 189       | 47        | 91                   | 4       | 72        | 9         | 261                      |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 291                  | 2       | 62        | 12        | 62                       |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 5                    | 0       | 31        | 10        | 31                       |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 118                  | 0       | 49        | 8         | 49                       |
| Oxford       | 73                                    | 28      | 8                            | 1,518 | 3,910                                        | 0  | 750   | 0   | 4,660     | 26        | 184                  | 7       | 83        | 12        | 4,743                    |
| Penobscot    | 0                                     | 254     | 0                            | 0     | 600                                          | 0  | 0     | 12  | 612       | 17        | 242                  | 71      | 239       | 10        | 851                      |
| Piscataquis  | 947                                   | 53      | 0                            | 0     | 1,303                                        | 0  | 512   | 136 | 1,951     | 27        | 67                   | 2       | 205       | 13        | 2,156                    |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 0                    | 0       | 0         | 0         | 0                        |
| Somerset     | 2,658                                 | 796     | 0                            | 0     | 6,127                                        | 0  | 53    | 271 | 6,451     | 20        | 59                   | 25      | 163       | 12        | 6,614                    |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 34                   | 2       | 163       | 13        | 163                      |
| Washington   | 302                                   | 8       | 0                            | 0     | 0                                            | 20 | 80    | 80  | 180       | 14        | 16                   | 2       | 111       | 22        | 291                      |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0  | 0     | 0   | 0         | 0         | 20                   | 2       | 74        | 11        | 74                       |
| State Total: | 7,604                                 | 7,265   | 12                           | 2,077 | 16,328                                       | 68 | 1,820 | 589 | 18,805    | 36        | 1,198                | 152     | 1,636     | 14        | 20,441                   |

## Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

## Frequency Distribution of Clearcutting

for Large Landowners who own more than 100,000 acres

2012 Clearcut as  
percent of statewide  
ownership

# of Landowners

Clearcut Acres

**0% - 0.001%**

**16**

**8,691**

**0.001%-0.25%**

**5**

**10,114**

**0.26%-0.75%**

**0**

**0**

**0.76%-1.00%**

**0**

**0**

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## Maine Forest Service District Foresters

### Ken Canfield

2281 Alfred Road  
Lyman, ME 04002  
Phone: (207) 441-3712  
E-mail: ken.canfield@maine.gov

### Morten Moesswilde

536 Waldoboro Road  
Jefferson, ME 04348  
Phone: (207) 441-2895  
E-mail: morten.moesswilde@maine.gov

### Vacant

P.O. Box 130  
Jonesboro, ME 04468  
Phone: (207) 592-2239  
E-mail:

### Vacant

P.O. Box 415  
Old Town, ME 04468  
Phone: (207) 592-2239  
E-mail:

### Dan Jacobs

2 Forestry Road  
Island Falls, ME 04747  
Phone: (207) 441-4128  
E-mail: dan.jacobs@maine.gov

### Shane Duigan

356 Shaker Road  
Gray, ME 04039  
Phone: (207) 592-1251  
E-mail: shane.p.duigan@maine.gov

### Patty Cormier

PO Box 416  
Norridgewock, ME 04957  
Phone: (207) 592-2238  
E-mail: patty.cormier@maine.gov

### Gordon Moore

P.O. Box 1107  
Greenville, ME 04441  
Phone: (207) 441-4139  
E-mail: gordon.moore@maine.gov

### Merle Ring

131 Bethel Road  
West Paris, ME 04289  
Phone: (207) 441-3276  
E-mail: merle.ring@maine.gov

### Dave Rochester

45 Radar Road  
Ashland, ME 04732  
Phone: (207) 441-3817  
E-mail: dave.rochester@maine.gov

**Maine Forest Service - Main Office - Augusta** 1-800-367-0223 (instate) or 207-287-2791  
email: forestinfo@maine.gov

**2013**

# **Silvicultural Activities Report**

**including Annual Report on Clearcutting and Precommercial Activities**

Compiled from the 2013 Landowner Reports and other survey instruments.  
Data collected under the provisions of Title 12 MRS §8885 and §8878-A

**Published:  
December 11, 2014**



**Department of Agriculture, Conservation and Forestry**

**Maine Forest Service**

**Forest Policy and Management Division**

**#22 SHS, Augusta, ME 04333**

**(207)287-2791 OR 1-800-367-0223(instate)**

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## Report Highlights

### Harvesting and Land Use Changes

- 414,797 acres were harvested in 2013, a decrease from 443,790 acres in 2012.
- 385,389 acres were "partially harvested" (partial and shelterwood totals) in 2013, an 8% decrease from 418,751 acres in 2012.
- The number of harvests reported decreased from 5,998 to 5,705.

#### Clearcutting:

1. The total area clearcut increased, from 20,461 acres in 2012 to 25,037 acres in 2013. Clearcutting amounted to 6% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 93% of all clearcut acreage (23,292 acres).
3. Average clearcut size in 2013 was 23 acres. Landowners owning more than 100,000 acres had an average clearcut size of 36 acres. Landowners owning less than 100,000 acres had an average clearcut size of 14 acres. 28 clearcuts larger than 75 acres were created in 2013.
4. The primary silvicultural reason for clearcutting reported by large landowners was the removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use decreased 5% from 4,578 acres in 2012 to 4,371 acres in 2013.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation a decrease of 17%, from 1,105 acres in 2012 to 913 acres in 2013.
- To release crop trees from competing vegetation decreased 86%, from 9,507 acres in 2012 to 1,367 acres in 2013.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws increased 53%, from 8,802 acres in 2012 to 13,474 acres in 2013. 95% of the acreage was done by landowners owning more than 100,000 acres (12,856 acres).

#### Planting:

- Tree planting decreased 12%, from 7,417 acres in 2012 to 6,552 acres in 2013. 98% of the planting acreage was by landowners owning more than 100,000 acres (6,439 acres).

### Forester Involvement

- In 2013, licensed foresters supervised harvesting on 297,340 acres, compared to 329,893 acres in 2012. 72% of all harvest acres in 2013 had a licensed forester involved; a slight decrease from 2012 (74%).
- Licensed Forester supervision occurred on 28% (696 out of 2,470 harvests) of the harvests on family forests ( $\leq 100$  acres in all ownership types) in 2013. This is similar to 2012 (752 out of 2,675 harvests).

## 2013 Harvesting and Land Use Changes

| Commercial Harvest Information by Landowner Size and Type |                        | Acres            |                               |             |                   |          |                 |               |
|-----------------------------------------------------------|------------------------|------------------|-------------------------------|-------------|-------------------|----------|-----------------|---------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |             |                   | Clearcut | Land Use Change | Total Harvest |
|                                                           |                        |                  | Initial or Intermediate Entry | Final Entry | Total Shelterwood |          |                 |               |
| OwnershipType                                             | Ownership Size         |                  |                               |             |                   |          |                 |               |
| Forest Industry Woodlands                                 | 1 to 100 acres         | 80               | 0                             | 0           | 0                 | 0        | 0               | 80            |
|                                                           | 101 to 1,000 acres     | 20               | 0                             | 319         | 319               | 0        | 0               | 339           |
|                                                           | 1,001 to 100,000 acres | 1,084            | 119                           | 459         | 578               | 76       | 0               | 1,738         |
|                                                           | 100,000 + acres        | 11,695           | 5,980                         | 10,090      | 16,070            | 5,845    | 0               | 33,610        |
|                                                           | SubTotal               | 12,879           | 6,099                         | 10,868      | 16,967            | 5,921    | 0               | 35,767        |
| Investor Timberlands                                      | 1 to 100 acres         | 25               | 0                             | 0           | 0                 | 0        | 0               | 25            |
|                                                           | 101 to 1,000 acres     | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 1,001 to 100,000 acres | 515              | 423                           | 721         | 1,144             | 9        | 0               | 1,668         |
|                                                           | 100,000 + acres        | 14,891           | 16,945                        | 17,960      | 34,905            | 7,387    | 197             | 57,380        |
|                                                           | SubTotal               | 15,431           | 17,368                        | 18,681      | 36,049            | 7,396    | 197             | 59,073        |
| Non-Industrial Land                                       | 1 to 100 acres         | 39,416           | 2,588                         | 3,242       | 5,830             | 768      | 1,167           | 47,181        |
|                                                           | 101 to 1,000 acres     | 68,838           | 7,263                         | 8,006       | 15,269            | 494      | 2,222           | 86,823        |
|                                                           | 1,001 to 100,000 acres | 30,224           | 4,452                         | 11,564      | 16,016            | 221      | 662             | 47,123        |
|                                                           | 100,000 + acres        | 36,763           | 27,996                        | 42,994      | 70,990            | 9,952    | 24              | 117,729       |
|                                                           | SubTotal               | 175,241          | 42,299                        | 65,806      | 108,105           | 11,435   | 4,075           | 298,856       |
| Other Woodlands (Govt, etc.)                              | 1 to 100 acres         | 152              | 0                             | 0           | 0                 | 0        | 36              | 188           |
|                                                           | 101 to 1,000 acres     | 1,656            | 150                           | 106         | 256               | 19       | 22              | 1,953         |
|                                                           | 1,001 to 100,000 acres | 2,082            | 300                           | 587         | 887               | 158      | 30              | 3,157         |
|                                                           | 100,000 + acres        | 13,152           | 968                           | 1,564       | 2,532             | 108      | 11              | 15,803        |
|                                                           | SubTotal               | 17,042           | 1,418                         | 2,257       | 3,675             | 285      | 99              | 21,101        |
| 2013 Totals:                                              |                        | 220,593          | 67,184                        | 97,612      | 164,796           | 25,037   | 4,371           | 414,797       |
| Percent of 2013 Harvest:                                  |                        | 53.18%           | 16.20%                        | 23.53%      | 39.73%            | 6.04%    | 1.05%           | 100.00%       |
| 2012 Totals:                                              |                        | 229,394          | 84,758                        | 104,599     | 189,357           | 20,461   | 4,578           | 443,790       |
| Percent Change from 2012 to 2013:                         |                        | -4%              | -21%                          | -7%         | -13%              | 22%      | -5%             | -7%           |

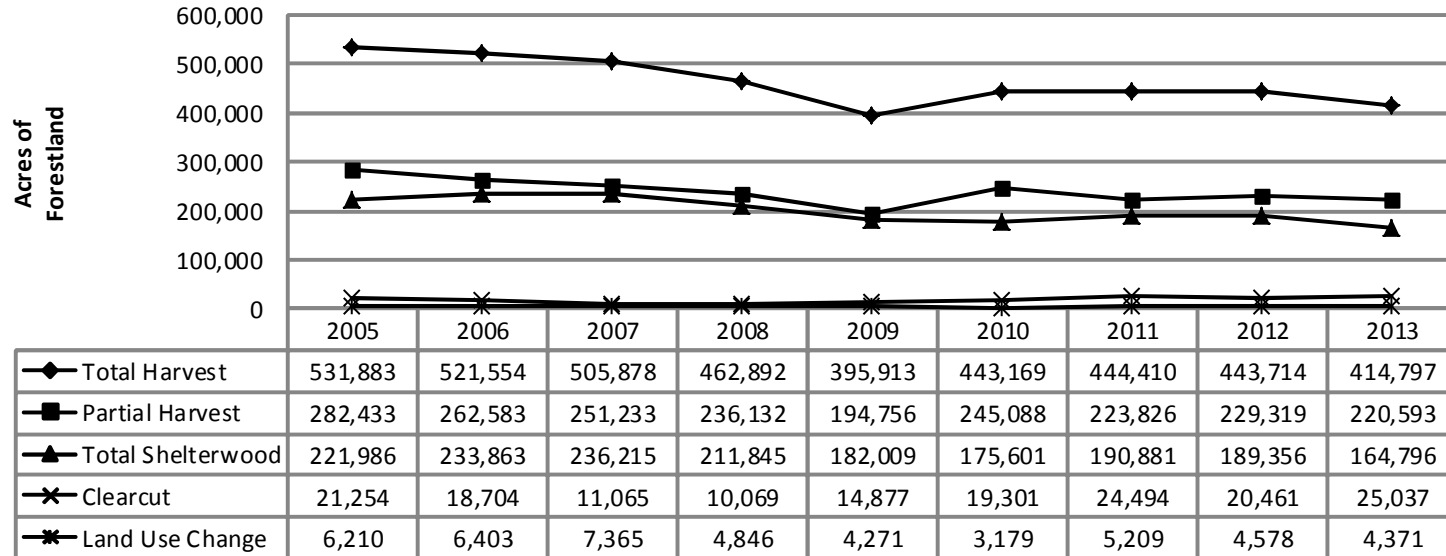
## 2013 Precommercial Activities and Professional Assistance

| OwnershipTypeOwnership Size  |                        | Precommercial Activities<br>by Landowner Size and Type |         |        |                  |  | Number<br>of<br>Reported<br>Harvests | Licensed Forester<br>Involvement |                |
|------------------------------|------------------------|--------------------------------------------------------|---------|--------|------------------|--|--------------------------------------|----------------------------------|----------------|
|                              |                        | Acres                                                  |         |        |                  |  |                                      | by Landowner Size and Type       |                |
|                              |                        | Herbicide Use                                          |         | TSI    | Tree<br>Planting |  |                                      | Number of<br>Harvests            | Total<br>Acres |
|                              |                        | Site Prep                                              | Release |        |                  |  |                                      |                                  |                |
| Forest Industry Woodlands    | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                |  | 3                                    | 1                                | 15             |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                |  | 3                                    | 2                                | 339            |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0      | 0                |  | 22                                   | 18                               | 1,558          |
|                              | 100,000 + acres        | 0                                                      | 0       | 4,333  | 5,151            |  | 57                                   | 51                               | 29,782         |
|                              | Subtotal               | 0                                                      | 0       | 4,333  | 5,151            |  | 85                                   | 72                               | 31,694         |
| Investor Timberlands         | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                |  | 1                                    | 1                                | 25             |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                |  | 0                                    | 0                                | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0      | 0                |  | 7                                    | 7                                | 1,668          |
|                              | 100,000 + acres        | 77                                                     | 533     | 2,012  | 104              |  | 136                                  | 130                              | 54,900         |
|                              | Subtotal               | 77                                                     | 533     | 2,012  | 104              |  | 144                                  | 138                              | 56,593         |
| Non-Industrial Land          | 1 to 100 acres         | 22                                                     | 25      | 245    | 29               |  | 2,460                                | 692                              | 16,252         |
|                              | 101 to 1,000 acres     | 26                                                     | 26      | 203    | 84               |  | 2,074                                | 670                              | 33,802         |
|                              | 1,001 to 100,000 acres | 50                                                     | 50      | 145    | 0                |  | 413                                  | 248                              | 32,671         |
|                              | 100,000 + acres        | 738                                                    | 733     | 6,465  | 1,184            |  | 366                                  | 337                              | 106,063        |
|                              | Subtotal               | 836                                                    | 834     | 7,058  | 1,297            |  | 5,313                                | 1,947                            | 188,788        |
| Other Woodlands (Govt, etc.) | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                |  | 6                                    | 2                                | 15             |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                |  | 48                                   | 38                               | 1,720          |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 25     | 0                |  | 35                                   | 31                               | 2,869          |
|                              | 100,000 + acres        | 0                                                      | 0       | 46     | 0                |  | 74                                   | 69                               | 15,661         |
|                              | Subtotal               | 0                                                      | 0       | 71     | 0                |  | 163                                  | 140                              | 20,265         |
| 2013 Totals:                 |                        | 913                                                    | 1,367   | 13,474 | 6,552            |  | 5,705                                | 2,297                            | 297,340        |
| 2012 Totals:                 |                        | 1,105                                                  | 9,507   | 8,802  | 7,417            |  | 5,998                                | 2,468                            | 329,894        |
| Change from 2012 to 2013:    |                        | -17%                                                   | -86%    | 53%    | -12%             |  | -5%                                  | -7%                              | -10%           |

**Definitions:**

|                                 |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b><u>Ownership Type</u></b>    | <b><i>Forest Industry Land:</i></b> Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                 | <b><i>Investor Timberlands</i></b> Woodlands owned by organizations, including Timberland Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs) that hold timberland assets as fiduciaries for the benefit of others.                                                                                                                                                                                                                                                                                                                                                                                 |
|                                 | <b><i>Non-Industrial Land:</i></b> Woodlands privately owned but NOT by a forest industry. These include private individuals and other non-forest product industries.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                                 | <b><i>Other woodlands:</i></b> Woodlands owned by other entities not listed above -- including local, state, federal, or tribal governments.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b><u>Types of Harvests</u></b> | <b><i>Partial Harvest:</i></b> Harvest where trees are removed individually or in small (<5 acre) patches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                                 | <b><i>Shelterwood:</i></b> Harvest of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.                                                                                                                                                                                                                                                                                                                                                                                 |
|                                 | <b><i>Clearcut:</i></b> Harvest on a site larger than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Service Rules Chapter 20 for additional information. It can be found on the Maine Forest Service website at <a href="http://www.state.me.us/doc/mfs/rules_regs/index.htm">http://www.state.me.us/doc/mfs/rules_regs/index.htm</a> |
|                                 | <b><i>Change of Land Use:</i></b> Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

### Harvesting Trends in Maine 2005-2013



# 2013 Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2013 Landowner Reports and other survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRS § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |     |       |     |           |           | All Other Landowners |         |           |           | All Landowners           |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|-----|-------|-----|-----------|-----------|----------------------|---------|-----------|-----------|--------------------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |     |       |     |           |           | <u>Acres</u>         |         |           |           | <u>Acres</u><br>Clearcut |
|              | <u>Acres</u>                          |         | #                            | Acres | 1                                            | 2   | 3     | 4   | Sub Total | Avg. Size | TSI                  | Planted | Sub Total | Avg. Size |                          |
|              | TSI                                   | Planted |                              |       |                                              |     |       |     |           |           |                      |         |           |           |                          |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 0                    | 0       | 0         | 0         | 0                        |
| Aroostook    | 8,229                                 | 4,295   | 19                           | 2,101 | 6,264                                        | 0   | 216   | 0   | 6,480     | 32        | 24                   | 9       | 263       | 15        | 6,743                    |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 47                   | 1       | 50        | 10        | 50                       |
| Franklin     | 214                                   | 160     | 4                            | 726   | 1,593                                        | 22  | 1,539 | 0   | 3,154     | 24        | 40                   | 1       | 105       | 15        | 3,259                    |
| Hancock      | 0                                     | 0       | 0                            | 0     | 72                                           | 0   | 0     | 0   | 72        | 36        | 70                   | 0       | 78        | 11        | 150                      |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 3                    | 4       | 37        | 12        | 37                       |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 3                    | 0       | 56        | 11        | 56                       |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 0                    | 1       | 45        | 15        | 45                       |
| Oxford       | 123                                   | 0       | 4                            | 738   | 2,915                                        | 205 | 602   | 0   | 3,722     | 21        | 56                   | 17      | 97        | 9         | 3,819                    |
| Penobscot    | 146                                   | 960     | 0                            | 0     | 1,256                                        | 11  | 0     | 8   | 1,275     | 32        | 119                  | 13      | 225       | 13        | 1,500                    |
| Piscataquis  | 2,309                                 | 799     | 0                            | 0     | 1,798                                        | 102 | 203   | 0   | 2,103     | 28        | 13                   | 7       | 89        | 15        | 2,192                    |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 13                   | 0       | 8         | 8         | 8                        |
| Somerset     | 1,795                                 | 225     | 1                            | 214   | 5,297                                        | 310 | 107   | 362 | 6,076     | 19        | 39                   | 35      | 288       | 12        | 6,364                    |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 27                   | 24      | 96        | 12        | 96                       |
| Washington   | 40                                    | 0       | 0                            | 0     | 194                                          | 0   | 216   | 0   | 410       | 17        | 114                  | 0       | 174       | 12        | 584                      |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 50                   | 1       | 134       | 11        | 134                      |
| State Total: | 12,856                                | 6,439   | 28                           | 3,779 | 19,389                                       | 650 | 2,883 | 370 | 23,292    | 36        | 618                  | 113     | 1,745     | 14        | 25,037                   |

## Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

## Frequency Distribution of Clearcutting for Large Landowners who own more than 100,000 acres

2013 Clearcut as  
percent of statewide  
ownership

# of Landowners

Clearcut Acres

**0% - 0.001%**

**12**

**5,376**

**0.001%-0.25%**

**2**

**1,650**

**0.26%-0.75%**

**7**

**16,266**

**0.76%-1.00%**

**0**

**0**



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## Maine Forest Service District Foresters

### Ken Canfield

2281 Alfred Road  
Lyman, ME 04002  
Phone: (207) 441-3712  
E-mail: ken.canfield@maine.gov

### Morten Moesswilde

536 Waldoboro Road  
Jefferson, ME 04348  
Phone: (207) 441-2895  
E-mail: morten.moesswilde@maine.gov

### Sandy Walczyk

P.O. Box 130  
Jonesboro, ME 04468  
Phone: (207) 441-4924  
E-mail: sandra.l.walczyk@maine.gov

### Terri Coolong

P.O. Box 415  
Old Town, ME 04468  
Phone: (207) 215-0679  
E-mail: terri.r.coolong@maine.gov

### Dan Jacobs

2 Forestry Road  
Island Falls, ME 04747  
Phone: (207) 441-4128  
E-mail: dan.jacobs@maine.gov

### Shane Duigan

356 Shaker Road  
Gray, ME 04039  
Phone: (207) 592-1251  
E-mail: shane.p.duigan@maine.gov

### Patty Cormier

P.O. Box 416  
Norridgewock, ME 04957  
Phone: (207) 592-2238  
E-mail: patty.cormier@maine.gov

### Gordon Moore

P.O. Box 1107  
Greenville, ME 04441  
Phone: (207) 441-4139  
E-mail: gordon.moore@maine.gov

### Merle Ring

131 Bethel Road  
West Paris, ME 04289  
Phone: (207) 441-3276  
E-mail: merle.ring@maine.gov

### Dave Rochester

45 Radar Road  
Ashland, ME 04732  
Phone: (207) 441-3817  
E-mail: dave.rochester@maine.gov

**Maine Forest Service - Main Office - Augusta** 1-800-367-0223 (instate) or 207-287-2791  
email: forestinfo@maine.gov

# 2014

## Silvicultural Activities Report

### including Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2014 Landowner Reports and other survey instruments.  
Data collected under the provisions of Title 12 MRS §8885

**Published:**  
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**Department of Agriculture, Conservation and Forestry**  
**Maine Forest Service**  
**Forest Policy and Management Division**  
**#22 SHS, Augusta, ME 04333**  
**(207)287-2791 OR 1-800-367-0223(instate)**  
**[www.maineforestservice.gov](http://www.maineforestservice.gov); [www.bewoodswise.org](http://www.bewoodswise.org)**  
***We help you make informed decisions about Maine's forests***  
**This publication is available online at: [www.maineforestservice.gov](http://www.maineforestservice.gov)**

## Report Highlights

### Harvesting and Land Use Changes

- 424,456 acres were harvested in 2014, an increase from 415,255 acres in 2013.
- 395,427 acres were "partially harvested" (partial and shelterwood totals) in 2014, a 2% increase from 385,784 acres in 2013.
- The number of harvests reported increased from 5,723 to 5,921.

#### Clearcutting:

1. The total area clearcut decreased, from 25,055 acres in 2013 to 23,369 acres in 2014. Clearcutting amounted to 5.5% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 93% of all clearcut acreage (21,663 acres).
3. Average clearcut size in 2014 was 25 acres. Landowners owning more than 100,000 acres had an average clearcut size of 36 acres. Landowners owning less than 100,000 acres had an average clearcut size of 14 acres. 26 clearcuts larger than 75 acres were created in 2013.
4. The primary silvicultural reason for clearcutting reported by large landowners was the removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use increased 28% from 4,416 acres in 2013 to 5,660 acres in 2014.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation a increase of 48%, from 913 acres in 2013 to 1,355 acres in 2014.
- To release crop trees from competing vegetation increased 190%, from 1,367 acres in 2013 to 3,966 acres in 2014.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws increased 24%, from 13,474 acres in 2013 to 16,759 acres in 2014.
- 94% of the acreage was done by landowners owning more than 100,000 acres (15,774 acres).

#### Planting:

- Tree planting decreased 20%, from 6,554 acres in 2013 to 5,222 acres in 2014.
- 98% of the planting acreage was by landowners owning more than 100,000 acres (5,121 acres).

### Forester Involvement

- In 2014, licensed foresters supervised harvesting on 299,559 acres, compared to 297,101 acres in 2013.
- 71% of all harvest acres in 2014 had a licensed forester involved; a slight decrease from 2013 (72%).
- Licensed Forester supervision occurred on 29% (777 out of 2,663 harvests) of the harvests on family forests (<= 100 acres in all ownership types) in 2014. This is similiar to 2013 (696 out of 2,470 harvests).

## 2014 Harvesting and Land Use Changes

| Commercial Harvest Information by Landowner Size and Type |                        | Acres            |                               |             |                   |          |                 |               |
|-----------------------------------------------------------|------------------------|------------------|-------------------------------|-------------|-------------------|----------|-----------------|---------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |             |                   | Clearcut | Land Use Change | Total Harvest |
|                                                           |                        |                  | Initial or Intermediate Entry | Final Entry | Total Shelterwood |          |                 |               |
| OwnershipType                                             | Ownership Size         |                  |                               |             |                   |          |                 |               |
| Forest Industry Woodlands                                 | 1 to 100 acres         | 3                | 0                             | 0           | 0                 | 0        | 0               | 3             |
|                                                           | 101 to 1,000 acres     | 93               | 34                            | 10          | 44                | 0        | 0               | 137           |
|                                                           | 1,001 to 100,000 acres | 12,380           | 329                           | 770         | 1,099             | 15       | 106             | 13,600        |
|                                                           | 100,000 + acres        | 8,802            | 5,795                         | 12,843      | 18,638            | 5,479    | 0               | 32,919        |
|                                                           | SubTotal               | 21,278           | 6,158                         | 13,623      | 19,781            | 5,494    | 106             | 46,659        |
| Investor Timberlands                                      | 1 to 100 acres         | 10               | 0                             | 0           | 0                 | 0        | 0               | 10            |
|                                                           | 101 to 1,000 acres     | 90               | 57                            | 53          | 110               | 0        | 0               | 200           |
|                                                           | 1,001 to 100,000 acres | 607              | 1,330                         | 663         | 1,993             | 67       | 87              | 2,754         |
|                                                           | 100,000 + acres        | 14,958           | 17,679                        | 29,131      | 46,810            | 10,022   | 66              | 71,856        |
|                                                           | SubTotal               | 15,665           | 19,066                        | 29,847      | 48,913            | 10,089   | 153             | 74,820        |
| Non-Industrial Land                                       | 1 to 100 acres         | 43,740           | 3,642                         | 5,787       | 9,429             | 631      | 1,313           | 55,113        |
|                                                           | 101 to 1,000 acres     | 67,130           | 7,331                         | 7,627       | 14,958            | 692      | 1,545           | 84,325        |
|                                                           | 1,001 to 100,000 acres | 25,061           | 5,419                         | 14,165      | 19,584            | 233      | 903             | 45,781        |
|                                                           | 100,000 + acres        | 26,629           | 20,925                        | 45,076      | 66,001            | 6,134    | 35              | 98,799        |
|                                                           | SubTotal               | 162,560          | 37,317                        | 72,655      | 109,972           | 7,690    | 3,796           | 284,018       |
| Other Woodlands (Govt, etc.)                              | 1 to 100 acres         | 186              | 38                            | 0           | 38                | 0        | 54              | 278           |
|                                                           | 101 to 1,000 acres     | 1,232            | 54                            | 107         | 161               | 30       | 1,166           | 2,589         |
|                                                           | 1,001 to 100,000 acres | 1,909            | 614                           | 693         | 1,307             | 38       | 133             | 3,387         |
|                                                           | 100,000 + acres        | 11,390           | 290                           | 745         | 1,035             | 28       | 252             | 12,705        |
|                                                           | SubTotal               | 14,717           | 996                           | 1,545       | 2,541             | 96       | 1,605           | 18,959        |
| 2014 Totals:                                              |                        | 214,220          | 63,537                        | 117,670     | 181,207           | 23,369   | 5,660           | 424,456       |
| Percent of 2014 Harvest:                                  |                        | 50.47%           | 14.97%                        | 27.72%      | 42.69%            | 5.51%    | 1.33%           | 100.00%       |
| 2013 Totals:                                              |                        | 220,967          | 67,206                        | 97,611      | 164,817           | 25,055   | 4,416           | 415,255       |
| Percent Change from 2013 to 2014:                         |                        | -3%              | -5%                           | 21%         | 10%               | -7%      | 28%             | 2%            |



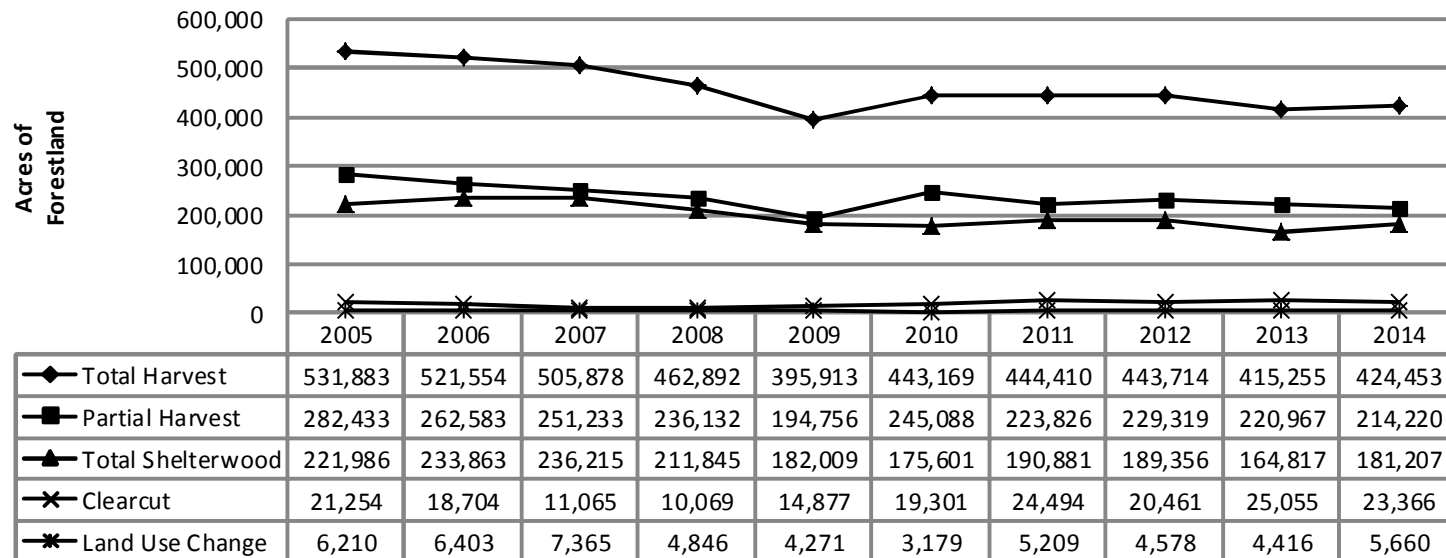
## 2014 Precommercial Activities and Professional Assistance

| OwnershipTypeOwnership Size  |                        | Precommercial Activities<br>by Landowner Size and Type |         |        |                  |  | Number<br>of<br>Reported<br>Harvests | Licensed Forester<br>Involvement |                |
|------------------------------|------------------------|--------------------------------------------------------|---------|--------|------------------|--|--------------------------------------|----------------------------------|----------------|
|                              |                        | Acres                                                  |         |        |                  |  |                                      | by Landowner Size and Type       |                |
|                              |                        | Herbicide Use                                          |         | TSI    | Tree<br>Planting |  |                                      | Number of<br>Harvests            | Total<br>Acres |
|                              |                        | Site Prep                                              | Release |        |                  |  |                                      |                                  |                |
| Forest Industry Woodlands    | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                |  | 0                                    | 0                                | 0              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                |  | 5                                    | 1                                | 8              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0      | 0                |  | 61                                   | 46                               | 8,932          |
|                              | 100,000 + acres        | 0                                                      | 0       | 8,635  | 3,833            |  | 86                                   | 62                               | 32,834         |
|                              | Subtotal               | 0                                                      | 0       | 8,635  | 3,833            |  | 152                                  | 109                              | 41,774         |
| Investor Timberlands         | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                |  | 1                                    | 1                                | 10             |
|                              | 101 to 1,000 acres     | 20                                                     | 0       | 27     | 6                |  | 4                                    | 4                                | 200            |
|                              | 1,001 to 100,000 acres | 0                                                      | 19      | 0      | 0                |  | 11                                   | 10                               | 2,735          |
|                              | 100,000 + acres        | 7                                                      | 685     | 1,586  | 103              |  | 155                                  | 140                              | 63,406         |
|                              | Subtotal               | 27                                                     | 704     | 1,613  | 109              |  | 171                                  | 155                              | 66,351         |
| Non-Industrial Land          | 1 to 100 acres         | 26                                                     | 14      | 396    | 41               |  | 2,644                                | 771                              | 20,299         |
|                              | 101 to 1,000 acres     | 30                                                     | 77      | 265    | 45               |  | 2,001                                | 730                              | 34,789         |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 297    | 8                |  | 444                                  | 257                              | 32,716         |
|                              | 100,000 + acres        | 1,272                                                  | 3,171   | 5,550  | 1,185            |  | 332                                  | 292                              | 86,181         |
|                              | Subtotal               | 1,328                                                  | 3,262   | 6,508  | 1,279            |  | 5,421                                | 2,050                            | 173,985        |
| Other Woodlands (Govt, etc.) | 1 to 100 acres         | 0                                                      | 0       | 0      | 1                |  | 18                                   | 5                                | 134            |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                |  | 55                                   | 28                               | 1,613          |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0      | 0                |  | 41                                   | 36                               | 3,338          |
|                              | 100,000 + acres        | 0                                                      | 0       | 3      | 0                |  | 63                                   | 58                               | 12,364         |
|                              | Subtotal               | 0                                                      | 0       | 3      | 1                |  | 177                                  | 127                              | 17,449         |
| 2014 Totals:                 |                        | 1,355                                                  | 3,966   | 16,759 | 5,222            |  | 5,921                                | 2,441                            | 299,559        |
| 2013 Totals:                 |                        | 913                                                    | 1,367   | 13,474 | 6,554            |  | 5,723                                | 2,297                            | 297,101        |
| Change from 2013 to 2014:    |                        | 48%                                                    | 190%    | 24%    | -20%             |  | 3%                                   | 6%                               | 1%             |

**Definitions:**

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ownership Type</b>    | <b>Forest Industry Land:</b> Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                          | <b>Investor Timberlands</b> Woodlands owned by organizations, including Timberland Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs) that hold timberland assets as fiduciaries for the benefit of others.                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | <b>Non-Industrial Land:</b> Woodlands privately owned but NOT by a forest industry. These include private individuals and other non-forest product industries.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | <b>Other woodlands:</b> Woodlands owned by other entities not listed above -- including local, state, federal, or tribal governments.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Types of Harvests</b> | <b>Partial Harvest:</b> Harvest where trees are removed individually or in small (<5 acre) patches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                          | <b>Shelterwood:</b> Harvest of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | <b>Clearcut:</b> Harvest on a site larger than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Service Rules Chapter 20 for additional information. It can be found on the Maine Forest Service website at <a href="http://www.state.me.us/doc/mfs/rules_regs/index.htm">http://www.state.me.us/doc/mfs/rules_regs/index.htm</a> |
|                          | <b>Change of Land Use:</b> Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |

### Harvesting Trends in Maine 2005-2014



## 2014 Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2014 Landowner Reports and other survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRS § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |     |       |     |           |           | All Other Landowners |         |           |           | All Landowners           |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|-----|-------|-----|-----------|-----------|----------------------|---------|-----------|-----------|--------------------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |     |       |     |           |           | <u>Acres</u>         |         |           |           |                          |
|              | <u>Acres</u>                          |         | #                            | Acres | 1                                            | 2   | 3     | 4   | Sub Total | Avg. Size | TSI                  | Planted | Clearcut  |           | <u>Acres</u><br>Clearcut |
|              | TSI                                   | Planted |                              |       |                                              |     |       |     |           |           |                      |         | Sub Total | Avg. Size |                          |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 0                    | 20      | 78        | 16        | 78                       |
| Aroostook    | 10,806                                | 3,680   | 17                           | 1,980 | 5,437                                        | 0   | 79    | 0   | 5,516     | 75        | 70                   | 26      | 162       | 11        | 5,678                    |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 0                    | 0       | 37        | 7         | 37                       |
| Franklin     | 218                                   | 108     | 3                            | 476   | 1,669                                        | 0   | 967   | 0   | 2,636     | 24        | 41                   | 0       | 115       | 19        | 2,751                    |
| Hancock      | 0                                     | 0       | 0                            | 0     | 231                                          | 0   | 3     | 0   | 234       | 47        | 38                   | 0       | 80        | 8         | 314                      |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 32                   | 0       | 2         | 2         | 2                        |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 0                    | 0       | 55        | 7         | 55                       |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 29                   | 0       | 18        | 9         | 18                       |
| Oxford       | 109                                   | 0       | 3                            | 711   | 2,826                                        | 0   | 737   | 0   | 3,563     | 24        | 381                  | 0       | 257       | 14        | 3,820                    |
| Penobscot    | 284                                   | 305     | 0                            | 0     | 900                                          | 5   | 0     | 0   | 905       | 82        | 146                  | 6       | 139       | 9         | 1,044                    |
| Piscataquis  | 1,802                                 | 106     | 1                            | 98    | 405                                          | 0   | 250   | 98  | 753       | 22        | 57                   | 10      | 231       | 12        | 984                      |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 23                   | 3       | 0         | 0         | 0                        |
| Somerset     | 2,227                                 | 922     | 2                            | 330   | 6,994                                        | 96  | 127   | 330 | 7,547     | 21        | 130                  | 22      | 199       | 12        | 7,746                    |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 20                   | 10      | 188       | 13        | 188                      |
| Washington   | 308                                   | 0       | 0                            | 0     | 308                                          | 0   | 104   | 97  | 509       | 23        | 18                   | 0       | 53        | 9         | 562                      |
| York         | 20                                    | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 0                    | 4       | 92        | 10        | 92                       |
| State Total: | 15,774                                | 5,121   | 26                           | 3,595 | 18,770                                       | 101 | 2,267 | 525 | 21,663    | 36        | 985                  | 101     | 1,706     | 14        | 23,369                   |

### Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

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## Maine Forest Service District Foresters

### Oliver Markewicz

2281 Alfred Road  
Lyman, ME 04002  
Phone: (207) 441-3712  
E-mail: [oliver.c.markewicz@maine.gov](mailto:oliver.c.markewicz@maine.gov)

### Morten Moesswilde

536 Waldoboro Road  
Jefferson, ME 04348  
Phone: (207) 441-2895  
E-mail: [morten.moesswilde@maine.gov](mailto:morten.moesswilde@maine.gov)

### Sandy Walczyk

P.O. Box 130  
Jonesboro, ME 04468  
Phone: (207) 441-4924  
E-mail: [sandra.l.walczyk@maine.gov](mailto:sandra.l.walczyk@maine.gov)

### Terri Coolong

P.O. Box 415  
Old Town, ME 04468  
Phone: (207) 215-0679  
E-mail: [terri.r.coolong@maine.gov](mailto:terri.r.coolong@maine.gov)

### Dan Jacobs

2 Forestry Road  
Island Falls, ME 04747  
Phone: (207) 441-4128  
E-mail: [dan.jacobs@maine.gov](mailto:dan.jacobs@maine.gov)

### Shane Duigan

356 Shaker Road  
Gray, ME 04039  
Phone: (207) 592-1251  
E-mail: [shane.p.duigan@maine.gov](mailto:shane.p.duigan@maine.gov)

### Patty Cormier

PO Box 416  
Norridgewock, ME 04957  
Phone: (207) 592-2238  
E-mail: [patty.cormier@maine.gov](mailto:patty.cormier@maine.gov)

### Gordon Moore

P.O. Box 1107  
Greenville, ME 04441  
Phone: (207) 441-4139  
E-mail: [gordon.moore@maine.gov](mailto:gordon.moore@maine.gov)

### Merle Ring

131 Bethel Road  
West Paris, ME 04289  
Phone: (207) 441-3276  
E-mail: [merle.ring@maine.gov](mailto:merle.ring@maine.gov)

### Randy Lagasse

45 Radar Road  
Ashland, ME 04732  
Phone: (207) 557-1086  
E-mail: [randy.lagasse@maine.gov](mailto:randy.lagasse@maine.gov)

**Maine Forest Service - Main Office - Augusta** 1-800-367-0223 (instate) or 207-287-2791  
email: [forestinfo@maine.gov](mailto:forestinfo@maine.gov)



# 2015

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Department of Agriculture, Conservation and Forestry  
Maine Forest Service  
Forest Policy and Management Division  
#22 SHS, Augusta, ME 04333  
(207)287-2791 OR 1-800-367-0223(instate)  
[www.maineforestservice.gov](http://www.maineforestservice.gov); [www.bewoodswise.org](http://www.bewoodswise.org)  
*We help you make informed decisions about Maine's forests.*  
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## Report Highlights

### Harvesting and Land Use Change

- 400,832 acres were harvested in 2015, a decrease from 425,301 acres in 2014.
- 372,006 acres were "partially harvested" (partial and shelterwood totals) in 2015, a 6% decrease from 396,248 acres in 2014.
- The number of harvests reported decreased from 5,953 to 5,420.

#### Clearcutting:

1. The total area clearcut increased, from 23,374 acres in 2014 to 25,082 acres in 2015. Clearcutting amounted to 6.3% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 94% of all clearcut acreage (23,642 acres).
3. Average clearcut size in 2015 was 30 acres. Landowners owning more than 100,000 acres had an average clearcut size of 36 acres. Landowners owning less than 100,000 acres had an average clearcut size of 14 acres. 42 clearcuts larger than 75 acres were created in 2015.
4. The primary silvicultural reason for clearcutting reported by large landowners was the removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use decreased 34% from 5,678 acres in 2014 to 3,744 acres in 2015.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- For site preparation a increase of 44%, from 1,355 acres in 2014 to 1,957 acres in 2015.
- To release crop trees from competing vegetation increased 159%, from 3,966 acres in 2014 to 10,273 acres in 2015.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws decreased 27%, from 16,781 acres in 2014 to 12,212 acres in 2015.
- 96% of the acreage was done by landowners owning more than 100,000 acres (11,715 acres).

#### Planting:

- Tree planting increased 31%, from 5,223 acres in 2014 to 6,820 acres in 2015.
- 98% of the planting acreage was by landowners owning more than 100,000 acres (6,661 acres).

### Forester Involvement

- In 2015, licensed foresters supervised harvesting on 299,418 acres, compared to 299,567 acres in 2014.
- 75% of all harvest acres in 2015 had a licensed forester involved; an increase from 2014 (70% involvement).
- Licensed Forester supervision occurred on 35% (843 out of 2,380 harvests) of the harvests on non-industrial family forests (<= 100 acres) in 2015. This is a 3% increase from 2014 (771 out of 2,441 harvests).

## 2015 Harvesting and Land Use Changes

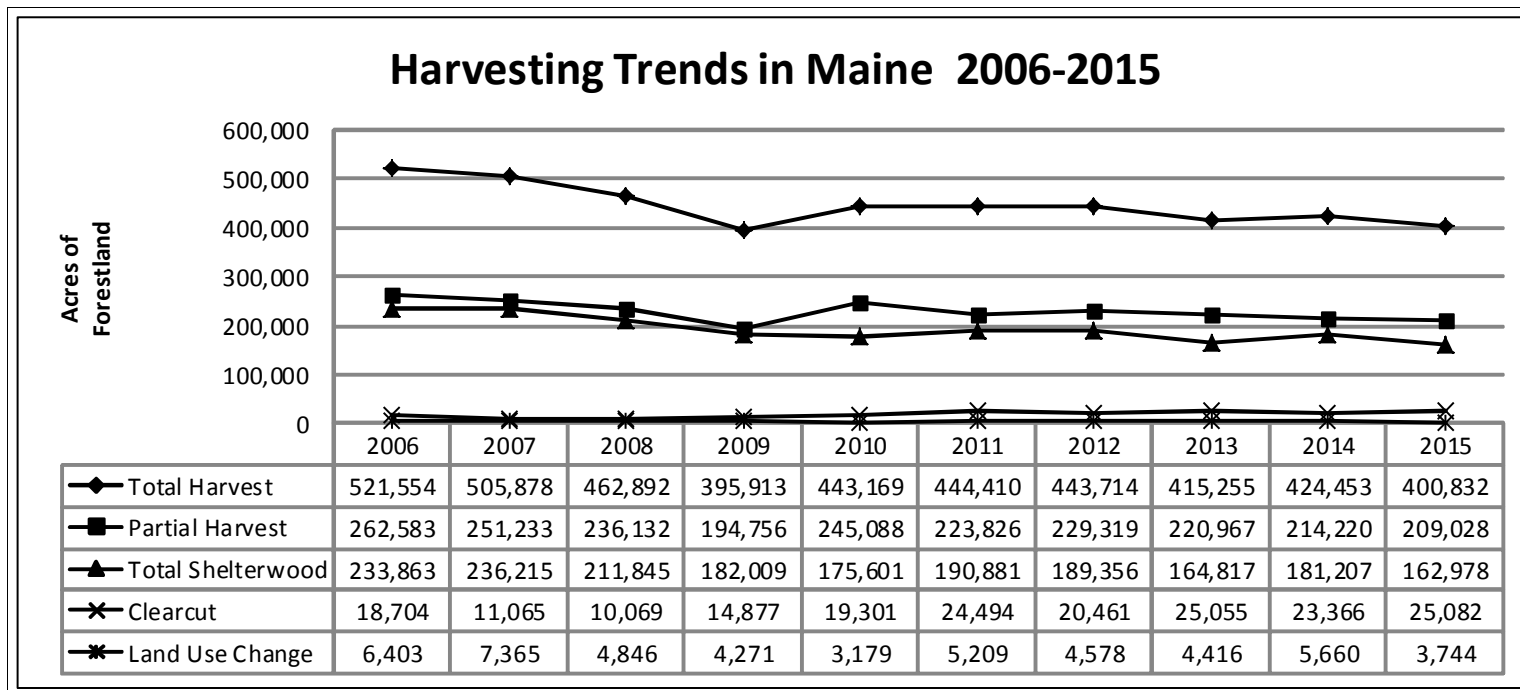
| Commercial Harvest Information by Landowner Size and Type |                        | Acres            |                               |             |                   |          |                 |               |
|-----------------------------------------------------------|------------------------|------------------|-------------------------------|-------------|-------------------|----------|-----------------|---------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |             |                   | Clearcut | Land Use Change | Total Harvest |
|                                                           |                        |                  | Initial or Intermediate Entry | Final Entry | Total Shelterwood |          |                 |               |
| OwnershipType                                             | Ownership Size         |                  |                               |             |                   |          |                 |               |
| Forest Industry Woodlands                                 | 1 to 100 acres         | 1                | 0                             | 0           | 0                 | 0        | 0               | 1             |
|                                                           | 101 to 1,000 acres     | 30               | 0                             | 0           | 0                 | 0        | 0               | 30            |
|                                                           | 1,001 to 100,000 acres | 10,383           | 1,034                         | 240         | 1,274             | 0        | 110             | 11,767        |
|                                                           | 100,000 + acres        | 8,520            | 8,069                         | 7,592       | 15,661            | 8,746    | 0               | 32,927        |
|                                                           | SubTotal               | 18,934           | 9,103                         | 7,832       | 16,935            | 8,746    | 110             | 44,725        |
| Investor Timberlands                                      | 1 to 100 acres         | 41               | 0                             | 0           | 0                 | 0        | 0               | 41            |
|                                                           | 101 to 1,000 acres     | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 1,001 to 100,000 acres | 646              | 761                           | 2,003       | 2,764             | 285      | 0               | 3,695         |
|                                                           | 100,000 + acres        | 14,293           | 6,268                         | 28,184      | 34,452            | 8,273    | 29              | 57,047        |
|                                                           | SubTotal               | 14,980           | 7,029                         | 30,187      | 37,216            | 8,558    | 29              | 60,783        |
| Non-Industrial Land                                       | 1 to 100 acres         | 48,768           | 3,293                         | 4,889       | 8,182             | 535      | 1,338           | 58,823        |
|                                                           | 101 to 1,000 acres     | 57,836           | 4,944                         | 5,886       | 10,830            | 317      | 1,183           | 70,166        |
|                                                           | 1,001 to 100,000 acres | 24,435           | 6,059                         | 11,993      | 18,052            | 286      | 620             | 43,393        |
|                                                           | 100,000 + acres        | 30,325           | 20,552                        | 47,767      | 68,319            | 6,609    | 277             | 105,530       |
|                                                           | SubTotal               | 161,364          | 34,848                        | 70,535      | 105,383           | 7,747    | 3,418           | 277,912       |
| Other Woodlands (Govt, etc.)                              | 1 to 100 acres         | 177              | 0                             | 0           | 0                 | 0        | 10              | 187           |
|                                                           | 101 to 1,000 acres     | 1,770            | 479                           | 74          | 553               | 0        | 35              | 2,358         |
|                                                           | 1,001 to 100,000 acres | 1,521            | 833                           | 339         | 1,172             | 17       | 116             | 2,826         |
|                                                           | 100,000 + acres        | 10,282           | 804                           | 915         | 1,719             | 14       | 26              | 12,041        |
|                                                           | SubTotal               | 13,750           | 2,116                         | 1,328       | 3,444             | 31       | 187             | 17,412        |
| 2015 Totals:                                              |                        | 209,028          | 53,096                        | 109,882     | 162,978           | 25,082   | 3,744           | 400,832       |
| Percent of 2015 Harvest                                   |                        | 52.15%           | 13.25%                        | 27.41%      | 40.66%            | 6.26%    | 0.93%           | 100.00%       |
| 2014 Totals:                                              |                        | 214,971          | 63,537                        | 117,741     | 181,277           | 23,374   | 5,678           | 425,301       |
| Percent Change from 2014 to 2015:                         |                        | -3%              | -16%                          | -7%         | -10%              | 7%       | -34%            | -6%           |

## 2015 Precommercial Activities and Professional Assistance

| OwnershipTypeOwnership Size  |                        | Precommercial Activities<br>by Landowner Size and Type |         |        |                  |  | Number<br>of<br>Reported<br>Harvests | Licensed Forester<br>Involvement |                |
|------------------------------|------------------------|--------------------------------------------------------|---------|--------|------------------|--|--------------------------------------|----------------------------------|----------------|
|                              |                        | Acres                                                  |         |        |                  |  |                                      | by Landowner Size and Type       |                |
|                              |                        | Herbicide Use                                          |         | TSI    | Tree<br>Planting |  |                                      | Number of<br>Harvests            | Total<br>Acres |
|                              |                        | Site Prep                                              | Release |        |                  |  |                                      |                                  |                |
| Forest Industry Woodlands    | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                |  | 1                                    | 0                                | 0              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                |  | 1                                    | 0                                | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0      | 0                |  | 56                                   | 21                               | 5,187          |
|                              | 100,000 + acres        | 0                                                      | 6,222   | 7,022  | 4,875            |  | 63                                   | 61                               | 31,772         |
|                              | Subtotal               | 0                                                      | 6,222   | 7,022  | 4,875            |  | 121                                  | 82                               | 36,959         |
| Investor Timberlands         | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                |  | 2                                    | 1                                | 40             |
|                              | 101 to 1,000 acres     | 15                                                     | 0       | 0      | 15               |  | 1                                    | 0                                | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0      | 0                |  | 14                                   | 14                               | 3,696          |
|                              | 100,000 + acres        | 0                                                      | 473     | 0      | 197              |  | 145                                  | 142                              | 55,490         |
|                              | Subtotal               | 15                                                     | 473     | 0      | 212              |  | 162                                  | 157                              | 59,226         |
| Non-Industrial Land          | 1 to 100 acres         | 4                                                      | 61      | 247    | 70               |  | 2,650                                | 843                              | 23,103         |
|                              | 101 to 1,000 acres     | 44                                                     | 33      | 173    | 53               |  | 1,590                                | 585                              | 32,192         |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 69     | 21               |  | 428                                  | 294                              | 32,872         |
|                              | 100,000 + acres        | 1,894                                                  | 3,284   | 4,693  | 1,589            |  | 340                                  | 312                              | 98,333         |
|                              | Subtotal               | 1,942                                                  | 3,378   | 5,182  | 1,733            |  | 5,008                                | 2,034                            | 186,500        |
| Other Woodlands (Govt, etc.) | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                |  | 11                                   | 5                                | 156            |
|                              | 101 to 1,000 acres     | 0                                                      | 10      | 0      | 0                |  | 34                                   | 26                               | 1,944          |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 8      | 0                |  | 31                                   | 24                               | 2,711          |
|                              | 100,000 + acres        | 0                                                      | 190     | 0      | 0                |  | 53                                   | 52                               | 11,922         |
|                              | Subtotal               | 0                                                      | 200     | 8      | 0                |  | 129                                  | 107                              | 16,733         |
| 2015 Totals:                 |                        | 1,957                                                  | 10,273  | 12,212 | 6,820            |  | 5,420                                | 2,380                            | 299,418        |
| 2014 Totals:                 |                        | 1,355                                                  | 3,966   | 16,781 | 5,223            |  | 5,953                                | 2,443                            | 299,567        |
| Change from 2014 to 2015:    |                        | 44%                                                    | 159%    | -27%   | 31%              |  | -9%                                  | -3%                              | 0%             |

**Definitions:**

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ownership Type</b>    | <b>Forest Industry Land:</b> Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                          | <b>Investor Timberlands:</b> Woodlands owned by organizations, including Timberland Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs) that hold timberland assets as fiduciaries for the benefit of others.                                                                                                                                                                                                                                                                                                                                                                                |
|                          | <b>Non-Industrial Land:</b> Woodlands privately owned but NOT by a forest industry. These include private individuals and other non-forest product industries.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | <b>Other woodlands:</b> Woodlands owned by other entities not listed above -- including local, state, federal, or tribal governments.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Types of Harvests</b> | <b>Partial Harvest:</b> Harvest where trees are removed individually or in small (<5 acre) patches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                          | <b>Shelterwood:</b> Harvest of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | <b>Clearcut:</b> Harvest on a site larger than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Service Rules Chapter 20 for additional information. It can be found on the Maine Forest Service website at <a href="http://www.state.me.us/doc/mfs/rules_regs/index.htm">http://www.state.me.us/doc/mfs/rules_regs/index.htm</a> |
|                          | <b>Change of Land Use:</b> Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |





# 2015 Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2015 Landowner Reports and other survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRS § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |     |       |     |           |           | All Other Landowners |         |           |           | All Landowners           |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|-----|-------|-----|-----------|-----------|----------------------|---------|-----------|-----------|--------------------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |     |       |     |           |           | <u>Acres</u>         |         |           |           |                          |
|              | <u>Acres</u>                          |         | #                            | Acres | 1                                            | 2   | 3     | 4   | Sub Total | Avg. Size | TSI                  | Planted | Clearcut  |           | <u>Acres</u><br>Clearcut |
|              | TSI                                   | Planted |                              |       |                                              |     |       |     |           |           |                      |         | Sub Total | Avg. Size |                          |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 10                   | 1       | 40        | 10        | 40                       |
| Aroostook    | 7,463                                 | 4,875   | 25                           | 2,738 | 7,524                                        | 0   | 42    | 344 | 7,910     | 198       | 9                    | 47      | 91        | 9         | 8,001                    |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 3                    | 1       | 15        | 5         | 15                       |
| Franklin     | 318                                   | 45      | 7                            | 1,268 | 1,327                                        | 0   | 1,692 | 0   | 3,019     | 28        | 37                   | 4       | 41        | 20        | 3,060                    |
| Hancock      | 0                                     | 0       | 0                            | 0     | 213                                          | 0   | 0     | 0   | 213       | 53        | 23                   | 0       | 290       | 21        | 503                      |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 101                  | 22      | 99        | 12        | 99                       |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 0                    | 0       | 46        | 15        | 46                       |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 55                   | 0       | 0         | 0         | 0                        |
| Oxford       | 0                                     | 0       | 5                            | 965   | 659                                          | 27  | 3,736 | 0   | 4,422     | 25        | 135                  | 2       | 64        | 8         | 4,486                    |
| Penobscot    | 818                                   | 197     | 1                            | 94    | 299                                          | 0   | 18    | 0   | 317       | 21        | 8                    | 52      | 57        | 10        | 374                      |
| Piscataquis  | 604                                   | 1,014   | 0                            | 0     | 729                                          | 29  | 354   | 68  | 1,180     | 19        | 86                   | 2       | 152       | 12        | 1,332                    |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 7                    | 0       | 0         | 0         | 0                        |
| Somerset     | 2,365                                 | 530     | 3                            | 416   | 5,187                                        | 52  | 589   | 361 | 6,189     | 21        | 17                   | 28      | 148       | 16        | 6,337                    |
| Waldo        | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 5                    | 0       | 92        | 15        | 92                       |
| Washington   | 147                                   | 0       | 1                            | 178   | 209                                          | 13  | 149   | 21  | 392       | 39        | 1                    | 0       | 109       | 10        | 501                      |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0   | 0     | 0   | 0         | 0         | 0                    | 0       | 196       | 11        | 196                      |
| State Total: | 11,715                                | 6,661   | 42                           | 5,659 | 16,147                                       | 121 | 6,580 | 794 | 23,642    | 36        | 497                  | 159     | 1,440     | 14        | 25,082                   |

## Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

**Conversion Table  
Cord/Weight Equivalents  
for various Maine Commercial Tree Species**

These conversions are used by the Maine Forest Service.

Users of this report may wish to confirm the conversion rate(s) used by individual mills and/or contractors who purchase wood.

These conversions factors are handy for making estimates and for forest inventory purposes, but are advisory only. The weight of a particular volume of wood varies greatly by species, time of year and other factors.

It is illegal in Maine to convert from one system of measurement to another for the basis of payment (e.g. convert a mill payment for pulpwood in dollars per ton to a landowner payment in dollars per cord).

| <u>Species</u>          | <u>Cords</u> | <u>Tons</u> | <u>Pounds</u> |
|-------------------------|--------------|-------------|---------------|
| <b>Spruce Fir</b>       | 1            | 2.1         | 4,200         |
| <b>White Pine</b>       | 1            | 2.15        | 4,300         |
| <b>Red Pine</b>         | 1            | 2.15        | 4,300         |
| <b>Hemlock</b>          | 1            | 2.4         | 4,800         |
| <b>Cedar</b>            | 1            | 1.7         | 3,400         |
| <b>Tamarack (Larch)</b> | 1            | 2.4         | 4,800         |
| <b>Beech</b>            | 1            | 2.25        | 4,500         |
| <b>White Birch</b>      | 1            | 2.25        | 4,500         |
| <b>Yellow Birch</b>     | 1            | 2.7         | 5,400         |
| <b>Sugar Maple</b>      | 1            | 2.7         | 5,400         |
| <b>Red Maple</b>        | 1            | 2.25        | 4,500         |
| <b>White Oak</b>        | 1            | 2.7         | 5,400         |
| <b>Red Oak</b>          | 1            | 2.7         | 5,400         |
| <b>Ash</b>              | 1            | 2.25        | 4,500         |
| <b>Aspen/Poplar</b>     | 1            | 2.15        | 4,300         |
| <b>Softwood</b>         | 1            | 2.3         | 4,600         |
| <b>Hardwood</b>         | 1            | 2.7         | 5,400         |
| <b>Mixed Wood</b>       | 1            | 2.3         | 4,600         |

***For purposes of comparing volumes, a rough conversion of 1 MBF = 2 cords is commonly used.***



## Maine Forest Service District Foresters

### Oliver Markewicz

2281 Alfred Road  
Lyman, ME 04002  
Phone: (207) 441-3712  
E-mail: [oliver.c.markewicz@maine.gov](mailto:oliver.c.markewicz@maine.gov)

### Morten Moesswilde

536 Waldoboro Road  
Jefferson, ME 04348  
Phone: (207) 441-2895  
E-mail: [morten.moesswilde@maine.gov](mailto:morten.moesswilde@maine.gov)

### Sandy Walczyk

P.O. Box 130  
Jonesboro, ME 04468  
Phone: (207) 441-4924  
E-mail: [sandra.l.walczyk@maine.gov](mailto:sandra.l.walczyk@maine.gov)

### Terri Coolong

P.O. Box 415  
Old Town, ME 04468  
Phone: (207) 215-0679  
E-mail: [terri.r.coolong@maine.gov](mailto:terri.r.coolong@maine.gov)

### Dan Jacobs

2 Forestry Road  
Island Falls, ME 04747  
Phone: (207) 441-4128  
E-mail: [dan.jacobs@maine.gov](mailto:dan.jacobs@maine.gov)

### Shane Duigan

356 Shaker Road  
Gray, ME 04039  
Phone: (207) 592-1251  
E-mail: [shane.p.duigan@maine.gov](mailto:shane.p.duigan@maine.gov)

### Patty Cormier

PO Box 416  
Norridgewock, ME 04957  
Phone: (207) 592-2238  
E-mail: [patty.cormier@maine.gov](mailto:patty.cormier@maine.gov)

### Vacant

P.O. Box 1107  
Greenville, ME 04441  
Phone: (207) 592-2239  
E-mail:

### Merle Ring

131 Bethel Road  
West Paris, ME 04289  
Phone: (207) 441-3276  
E-mail: [merle.ring@maine.gov](mailto:merle.ring@maine.gov)

### Randy Lagasse

45 Radar Road  
Ashland, ME 04732  
Phone: (207) 557-1086  
E-mail: [randy.lagasse@maine.gov](mailto:randy.lagasse@maine.gov)

**Maine Forest Service - Main Office - Augusta** 1-800-367-0223 (instate) or 207-287-2791  
email: [forestinfo@maine.gov](mailto:forestinfo@maine.gov)

# 2016

## Silvicultural Activities Report

### including Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2016 Landowner Reports and other survey instruments.  
Data collected under the provisions of 12 MRS §8885

**Published:**  
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Department of Agriculture, Conservation and Forestry  
Maine Forest Service  
Forest Policy and Management Division  
#22 SHS, Augusta, ME 04333  
(207)287-2791 OR 1-800-367-0223(instate)  
[www.maineforestservice.gov](http://www.maineforestservice.gov); [www.bewoodswise.org](http://www.bewoodswise.org)  
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This publication is available online at:[www.maineforestservice.gov](http://www.maineforestservice.gov)  
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## Report Highlights

### Harvesting and Land Use Change

- 344,210 acres were harvested in 2016, a decrease of 14% from 401,213 acres in 2015.
- 319,817 acres were partially harvested (partial and shelterwood totals) in 2016, a 14% decrease from 372,383 acres in 2015.
- The number of harvests reported decreased from 5,432 to 4,642.

#### Clearcutting:

1. The total area clearcut decreased, from 25,083 acres in 2015 to 20,971 acres in 2016. Clearcutting amounted to 6.1% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 92% of all clearcut acreage (19,283 acres).
3. Average clearcut size in 2016 was 32 acres. Landowners owning more than 100,000 acres had an average clearcut size of 36 acres. Landowners owning less than 100,000 acres had an average clearcut size of 14 acres. 16 clearcuts larger than 75 acres were created in 2016.
4. The primary silvicultural reason for clearcutting reported by large landowners was the removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use decreased 9% from 3,747 acres in 2015 to 3,422 acres in 2016.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- Site preparation increased 15%, from 1,957 acres in 2015 to 2,247 acres in 2016.
- To release crop trees from competing vegetation increased 31%, from 10,273 acres in 2015 to 13,464 acres in 2016.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws decreased 70%, from 12,212 acres in 2015 to 3,724 acres in 2016.
- 76% of the acreage was done by landowners owning more than 100,000 acres (2,818 acres).

#### Planting:

- Tree planting decreased 2%, from 6,820 acres in 2015 to 6,677 acres in 2016.
- 99% of the planting acreage was by landowners owning more than 100,000 acres (6,592 acres).

### Forester Involvement

- In 2016, licensed foresters supervised harvesting on 259,615 acres, compared to 295,335 acres in 2015.
- 75% of all harvest acres in 2016 had a licensed forester involved; an increase from 2015 (74% involvement).
- Licensed Forester supervision occurred on 32% (721 out of 2,240 harvests) of the harvests on non-industrial family forests (<= 100 acres) in 2016. This is the same percentage as in 2015 (843 out of 2,650 harvests).



## 2016 Harvesting Activities

| Commercial Harvest Information by Landowner Size and Type |                        | Acres            |                               |             |                   |          |                 |               |
|-----------------------------------------------------------|------------------------|------------------|-------------------------------|-------------|-------------------|----------|-----------------|---------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |             |                   | Clearcut | Land Use Change | Total Harvest |
|                                                           |                        |                  | Initial or Intermediate Entry | Final Entry | Total Shelterwood |          |                 |               |
| OwnershipType                                             | Ownership Size         |                  |                               |             |                   |          |                 |               |
| Forest Industry Woodlands                                 | 1 to 100 acres         | 0                | 0                             | 0           | 0                 | 0        | 12              | 12            |
|                                                           | 101 to 1,000 acres     | 240              | 0                             | 0           | 0                 | 0        | 0               | 240           |
|                                                           | 1,001 to 100,000 acres | 6,083            | 863                           | 171         | 1,034             | 34       | 0               | 7,151         |
|                                                           | 100,000 + acres        | 13,875           | 12,884                        | 18,712      | 31,596            | 6,432    | 4               | 51,907        |
|                                                           | SubTotal               | 20,198           | 13,747                        | 18,883      | 32,630            | 6,466    | 16              | 59,310        |
| Investor Timberlands                                      | 1 to 100 acres         | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 101 to 1,000 acres     | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 1,001 to 100,000 acres | 549              | 323                           | 2,236       | 2,559             | 0        | 166             | 3,274         |
|                                                           | 100,000 + acres        | 13,529           | 4,060                         | 23,206      | 27,266            | 5,792    | 72              | 46,659        |
|                                                           | SubTotal               | 14,078           | 4,383                         | 25,442      | 29,825            | 5,792    | 238             | 49,933        |
| Non-Industrial Land                                       | 1 to 100 acres         | 41,747           | 2,149                         | 4,651       | 6,800             | 527      | 1,398           | 50,472        |
|                                                           | 101 to 1,000 acres     | 46,443           | 4,258                         | 5,261       | 9,519             | 459      | 986             | 57,407        |
|                                                           | 1,001 to 100,000 acres | 27,610           | 3,285                         | 7,326       | 10,611            | 555      | 605             | 39,381        |
|                                                           | 100,000 + acres        | 17,463           | 17,648                        | 30,482      | 48,130            | 6,870    | 0               | 72,463        |
|                                                           | SubTotal               | 133,263          | 27,340                        | 47,720      | 75,060            | 8,411    | 2,989           | 219,723       |
| Other Woodlands (Govt, etc.)                              | 1 to 100 acres         | 350              | 15                            | 12          | 27                | 0        | 46              | 423           |
|                                                           | 101 to 1,000 acres     | 1,226            | 180                           | 0           | 180               | 113      | 38              | 1,557         |
|                                                           | 1,001 to 100,000 acres | 2,017            | 709                           | 542         | 1,251             | 0        | 4               | 3,272         |
|                                                           | 100,000 + acres        | 6,852            | 1,271                         | 1,589       | 2,860             | 189      | 91              | 9,992         |
|                                                           | SubTotal               | 10,445           | 2,175                         | 2,143       | 4,318             | 302      | 179             | 15,244        |
| 2016 Totals:                                              |                        | 177,984          | 47,645                        | 94,188      | 141,833           | 20,971   | 3,422           | 344,210       |
| Percent of 2016 Harvest                                   |                        | 51.71%           | 13.84%                        | 27.36%      | 41.21%            | 6.09%    | 0.99%           | 100.00%       |
| 2015 Totals:                                              |                        | 209,286          | 53,096                        | 110,001     | 163,097           | 25,083   | 3,747           | 401,213       |
| Percent Change from 2015 to 2016:                         |                        | -15%             | -10%                          | -14%        | -13%              | -16%     | -9%             | -14%          |

## 2016 Precommercial Activities and Professional Assistance

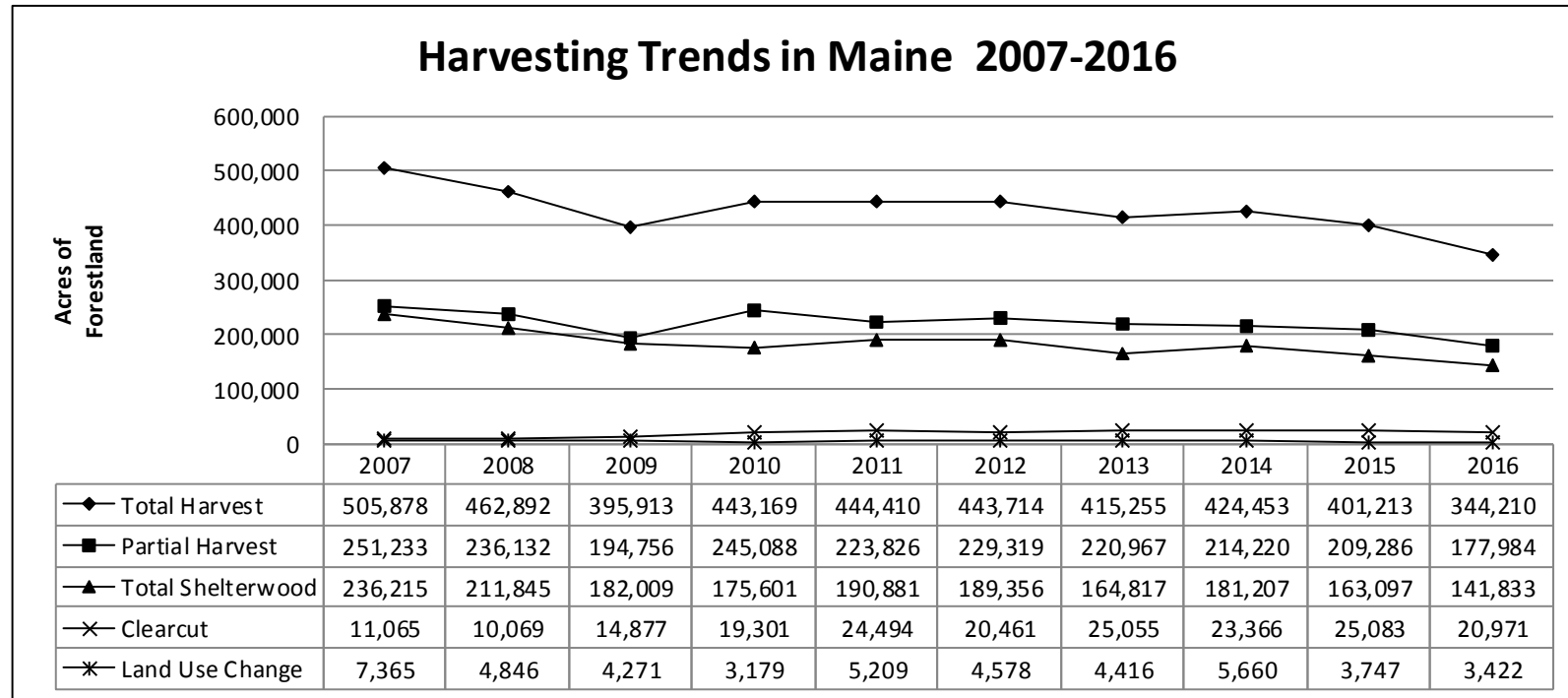
| OwnershipTypeOwnership Size  |                        | Precommercial Activities<br>by Landowner Size and Type |         |        |                  |  | Number<br>of<br>Reported<br>Harvests | Licensed Forester<br>Involvement |                |
|------------------------------|------------------------|--------------------------------------------------------|---------|--------|------------------|--|--------------------------------------|----------------------------------|----------------|
|                              |                        | Acres                                                  |         |        |                  |  |                                      | by Landowner Size and Type       |                |
|                              |                        | Herbicide Use                                          |         | TSI    | Tree<br>Planting |  |                                      | Number of<br>Harvests            | Total<br>Acres |
|                              |                        | Site Prep                                              | Release |        |                  |  |                                      |                                  |                |
| Forest Industry Woodlands    | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                |  | 1                                    | 1                                | 12             |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                |  | 3                                    | 0                                | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0      | 0                |  | 35                                   | 20                               | 1,915          |
|                              | 100,000 + acres        | 0                                                      | 10,845  | 1,589  | 4,079            |  | 132                                  | 106                              | 51,353         |
|                              | Subtotal               | 0                                                      | 10,845  | 1,589  | 4,079            |  | 171                                  | 127                              | 53,280         |
| Investor Timberlands         | 1 to 100 acres         | 0                                                      | 0       | 0      | 0                |  | 0                                    | 0                                | 0              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0      | 0                |  | 0                                    | 0                                | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0      | 0                |  | 13                                   | 13                               | 3,274          |
|                              | 100,000 + acres        | 0                                                      | 918     | 0      | 149              |  | 139                                  | 137                              | 44,535         |
|                              | Subtotal               | 0                                                      | 918     | 0      | 149              |  | 152                                  | 150                              | 47,809         |
| Non-Industrial Land          | 1 to 100 acres         | 20                                                     | 12      | 329    | 38               |  | 2,240                                | 721                              | 19,449         |
|                              | 101 to 1,000 acres     | 21                                                     | 19      | 536    | 39               |  | 1,263                                | 505                              | 26,713         |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0      | 0                |  | 394                                  | 289                              | 28,091         |
|                              | 100,000 + acres        | 2,204                                                  | 1,670   | 1,166  | 2,364            |  | 280                                  | 264                              | 70,015         |
|                              | Subtotal               | 2,245                                                  | 1,701   | 2,031  | 2,441            |  | 4,177                                | 1,779                            | 144,268        |
| Other Woodlands (Govt, etc.) | 1 to 100 acres         | 2                                                      | 0       | 2      | 3                |  | 22                                   | 10                               | 259            |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 34     | 5                |  | 42                                   | 28                               | 940            |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 5      | 0                |  | 26                                   | 24                               | 3,167          |
|                              | 100,000 + acres        | 0                                                      | 0       | 63     | 0                |  | 52                                   | 50                               | 9,892          |
|                              | Subtotal               | 2                                                      | 0       | 104    | 8                |  | 142                                  | 112                              | 14,258         |
| 2016 Totals:                 |                        | 2,247                                                  | 13,464  | 3,724  | 6,677            |  | 4,642                                | 2,168                            | 259,615        |
| 2015 Totals:                 |                        | 1,957                                                  | 10,273  | 12,212 | 6,820            |  | 5,432                                | 2,381                            | 295,335        |
| Change from 2015 to 2016:    |                        | 15%                                                    | 31%     | -70%   | -2%              |  | -15%                                 | -9%                              | -12%           |

**344,210** *Statewide Total  
Harvest acres from  
previous page*

**401,213**

**Definitions:**

|                          |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Ownership Type</b>    | <b>Forest Industry Land:</b> Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                          | <b>Investor Timberlands:</b> Woodlands owned by organizations, including Timberland Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs) that hold timberland assets as fiduciaries for the benefit of others.                                                                                                                                                                                                                                                                                                                                                                                |
|                          | <b>Non-Industrial Land:</b> Woodlands privately owned but NOT by a forest industry. These include private individuals and other non-forest product industries.                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | <b>Other woodlands:</b> Woodlands owned by other entities not listed above -- including local, state, federal, or tribal governments.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          |
| <b>Types of Harvests</b> | <b>Partial Harvest:</b> Harvest where trees are removed individually or in small (<5 acre) patches.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|                          | <b>Shelterwood:</b> Harvest of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.                                                                                                                                                                                                                                                                                                                                                                                 |
|                          | <b>Clearcut:</b> Harvest on a site larger than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Service Rules Chapter 20 for additional information. It can be found on the Maine Forest Service website at <a href="http://www.state.me.us/doc/mfs/rules_regs/index.htm">http://www.state.me.us/doc/mfs/rules_regs/index.htm</a> |
|                          | <b>Change of Land Use:</b> Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |



# 2016 Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2016 Landowner Reports and other survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRS § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |       |       |     |           |           | All Other Landowners |         |           |           | All Landowners           |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|-------|-------|-----|-----------|-----------|----------------------|---------|-----------|-----------|--------------------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |       |       |     |           |           | <u>Acres</u>         |         |           |           |                          |
|              | <u>Acres</u>                          |         | #                            | Acres | 1                                            | 2     | 3     | 4   | Sub Total | Avg. Size | TSI                  | Planted | Clearcut  |           | <u>Acres</u><br>Clearcut |
|              | TSI                                   | Planted |                              |       |                                              |       |       |     |           |           |                      |         | Sub Total | Avg. Size |                          |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0     | 0     | 0   | 0         | 0         | 12                   | 0       | 10        | 5         | 10                       |
| Aroostook    | 1,589                                 | 4,134   | 1                            | 89    | 6,512                                        | 5     | 48    | 0   | 6,565     | 119       | 199                  | 3       | 297       | 17        | 6,862                    |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0     | 0     | 0   | 0         | 0         | 12                   | 4       | 44        | 6         | 44                       |
| Franklin     | 186                                   | 0       | 7                            | 1,313 | 989                                          | 1,097 | 879   | 0   | 2,965     | 34        | 1                    | 10      | 210       | 15        | 3,175                    |
| Hancock      | 0                                     | 0       | 1                            | 219   | 400                                          | 0     | 0     | 0   | 400       | 100       | 85                   | 3       | 289       | 17        | 689                      |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0     | 0     | 0   | 0         | 0         | 44                   | 0       | 80        | 80        | 80                       |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0     | 0     | 0   | 0         | 0         | 1                    | 0       | 0         | 0         | 0                        |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0     | 0     | 0   | 0         | 0         | 0                    | 0       | 20        | 20        | 20                       |
| Oxford       | 0                                     | 57      | 2                            | 222   | 750                                          | 763   | 649   | 0   | 2,162     | 23        | 50                   | 10      | 103       | 13        | 2,265                    |
| Penobscot    | 3                                     | 149     | 1                            | 96    | 277                                          | 0     | 12    | 0   | 289       | 29        | 3                    | 20      | 10        | 10        | 299                      |
| Piscataquis  | 392                                   | 1,237   | 1                            | 138   | 733                                          | 0     | 403   | 174 | 1,310     | 28        | 232                  | 27      | 45        | 9         | 1,355                    |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0     | 0     | 0   | 0         | 0         | 0                    | 0       | 0         | 0         | 0                        |
| Somerset     | 618                                   | 997     | 2                            | 373   | 5,045                                        | 0     | 53    | 8   | 5,106     | 22        | 72                   | 4       | 401       | 24        | 5,507                    |
| Waldo        | 0                                     | 18      | 0                            | 0     | 35                                           | 0     | 0     | 0   | 35        | 35        | 12                   | 0       | 113       | 16        | 148                      |
| Washington   | 30                                    | 0       | 1                            | 235   | 330                                          | 72    | 49    | 0   | 451       | 23        | 78                   | 0       | 24        | 12        | 475                      |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0     | 0     | 0   | 0         | 0         | 105                  | 4       | 42        | 7         | 42                       |
| State Total: | 2,818                                 | 6,592   | 16                           | 2,685 | 15,071                                       | 1,937 | 2,093 | 182 | 19,283    | 36        | 906                  | 85      | 1,688     | 14        | 20,971                   |

## Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

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## Maine Forest Service District Foresters

### Oliver Markewicz

2281 Alfred Road  
Lyman, ME 04002  
Phone: (207) 441-3712  
E-mail: oliver.c.markewicz@maine.gov

### Morten Moesswilde

536 Waldoboro Road  
Jefferson, ME 04348  
Phone: (207) 441-2895  
E-mail: morten.moesswilde@maine.gov

### Sandy Walczyk

P.O. Box 130  
Jonesboro, ME 04468  
Phone: (207) 441-4924  
E-mail: sandra.l.walczyk@maine.gov

### Terri Coolong

P.O. Box 415  
Old Town, ME 04468  
Phone: (207) 215-0679  
E-mail: terri.r.coolong@maine.gov

### Dan Jacobs

2 Forestry Road  
Island Falls, ME 04747  
Phone: (207) 441-4128  
E-mail: dan.jacobs@maine.gov

### Shane Duigan

356 Shaker Road  
Gray, ME 04039  
Phone: (207) 592-1251  
E-mail: shane.p.duigan@maine.gov

### Patty Cormier

PO Box 416  
Norridgewock, ME 04957  
Phone: (207) 592-2238  
E-mail: patty.cormier@maine.gov

### Adam Cates

P.O. Box 1107  
Greenville, ME 04441  
Phone: (207) 441-4139  
E-mail: adam.e.cates@maine.gov

### Vacant

131 Bethel Road  
West Paris, ME 04289  
Phone: (207) 592-2239  
E-mail:

### Randy Lagasse

45 Radar Road  
Ashland, ME 04732  
Phone: (207) 557-1086  
E-mail: randy.lagasse@maine.gov

**Maine Forest Service - Main Office - Augusta** 1-800-367-0223 (instate) or 207-287-2791  
email: forestinfo@maine.gov

**2017**

# **Silvicultural Activities Report**

**including Annual Report on Clearcutting and Precommercial Activities**

Compiled from the 2017 Landowner Reports and other survey instruments.  
Data collected under the provisions of 12 MRS §8885

**Published: September 12, 2018**



**Department of Agriculture, Conservation and Forestry**

**Maine Forest Service**

**Forest Policy and Management Division**

**#22 SHS, Augusta, ME 04333**

**(207)287-2791 OR 1-800-367-0223(instate)**

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## Report Highlights

### Harvesting and Land Use Change

- 335,624 acres were harvested in 2017, a decrease of 2% from 341,318 acres in 2016.
- 309,159 acres were partially harvested (partial and shelterwood totals) in 2017, a 2% decrease from 316,890 acres in 2016.
- The number of harvests reported decreased from 4,665 to 4,275.

#### Clearcutting:

1. The total area clearcut increased 8% from 20,971 acres in 2016 to 22,722 acres in 2017. Clearcutting amounted to 6.8% of total harvested acres.
2. Landowners owning more than 100,000 acres in Maine created 94% of all clearcut acreage (21,235 acres).
3. Average clearcut size in 2017 was 29 acres. Landowners owning more than 100,000 acres had an average clearcut size of 36 acres. Landowners owning less than 100,000 acres had an average clearcut size of 14 acres. 24 clearcuts larger than 75 acres were created in 2017.
4. The primary silvicultural reason for clearcutting reported by large landowners was the removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.

#### Land Use Changes:

- Harvesting to convert land from forest management to some other land use increased 8% from 3,457 acres in 2016 to 3,743 acres in 2017.

### Precommercial Silvicultural Activities

#### Herbicide Use:

- Site preparation decreased -59%, from 2,247 acres in 2016 to 932 acres in 2017.
- To release crop trees from competing vegetation decreased -13%, from 13,464 acres in 2016 to 11,769 acres in 2017.

#### Timber Stand Improvement (TSI):

- Precommercial thinning of young stands with spacing saws increased 136%, from 3,724 acres in 2016 to 8,791 acres in 2017.
- 83% of the acreage was done by landowners owning more than 100,000 acres (7,297 acres).

#### Planting:

- Tree planting increased 11%, from 6,677 acres in 2016 to 7,430 acres in 2017.
- 98% of the planting acreage was by landowners owning more than 100,000 acres (7,314 acres).

### Forester Involvement

- In 2017, licensed foresters supervised harvesting on 260,584 acres, compared to 258,506 acres in 2016.
- 78% of all harvest acres in 2017 had a licensed forester involved; an increase from 2016 (76% involvement).
- Licensed Forester supervision occurred on 32% (620 out of 1,968 harvests) of the harvests on non-industrial family forests (<= 100 acres) in 2017. This is the same percentage as in 2016 (721 out of 2,240 harvests).

## 2017 Harvesting Activities

| Commercial Harvest Information by Landowner Size and Type |                        | Acres            |                               |             |                   |          |                 |               |
|-----------------------------------------------------------|------------------------|------------------|-------------------------------|-------------|-------------------|----------|-----------------|---------------|
|                                                           |                        | Partial Harvests | Shelterwood                   |             |                   | Clearcut | Land Use Change | Total Harvest |
|                                                           |                        |                  | Initial or Intermediate Entry | Final Entry | Total Shelterwood |          |                 |               |
| OwnershipType                                             | Ownership Size         |                  |                               |             |                   |          |                 |               |
| Forest Industry Woodlands                                 | 1 to 100 acres         | 22               | 60                            | 0           | 60                | 0        | 13              | 95            |
|                                                           | 101 to 1,000 acres     | 23               | 0                             | 0           | 0                 | 0        | 0               | 23            |
|                                                           | 1,001 to 100,000 acres | 5,686            | 329                           | 94          | 423               | 46       | 100             | 6,255         |
|                                                           | 100,000 + acres        | 11,264           | 15,009                        | 18,885      | 33,894            | 7,593    | 0               | 52,751        |
|                                                           | SubTotal               | 16,995           | 15,398                        | 18,979      | 34,377            | 7,639    | 113             | 59,124        |
| Investor Timberlands                                      | 1 to 100 acres         | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 101 to 1,000 acres     | 0                | 0                             | 0           | 0                 | 0        | 0               | 0             |
|                                                           | 1,001 to 100,000 acres | 816              | 362                           | 1,788       | 2,150             | 32       | 0               | 2,998         |
|                                                           | 100,000 + acres        | 16,626           | 6,027                         | 24,579      | 30,606            | 5,807    | 0               | 53,039        |
|                                                           | SubTotal               | 17,442           | 6,389                         | 26,367      | 32,756            | 5,839    | 0               | 56,037        |
| Non-Industrial Land                                       | 1 to 100 acres         | 36,371           | 2,431                         | 3,866       | 6,297             | 346      | 1,297           | 44,311        |
|                                                           | 101 to 1,000 acres     | 45,026           | 3,838                         | 4,965       | 8,803             | 335      | 1,333           | 55,497        |
|                                                           | 1,001 to 100,000 acres | 22,822           | 5,867                         | 6,910       | 12,777            | 698      | 647             | 36,944        |
|                                                           | 100,000 + acres        | 15,208           | 17,497                        | 26,651      | 44,148            | 7,791    | 6               | 67,153        |
|                                                           | SubTotal               | 119,427          | 29,633                        | 42,392      | 72,025            | 9,170    | 3,283           | 203,905       |
| Other Woodlands (Govt, etc.)                              | 1 to 100 acres         | 391              | 4                             | 0           | 4                 | 10       | 56              | 461           |
|                                                           | 101 to 1,000 acres     | 1,258            | 74                            | 0           | 74                | 10       | 73              | 1,415         |
|                                                           | 1,001 to 100,000 acres | 1,670            | 916                           | 417         | 1,333             | 10       | 52              | 3,065         |
|                                                           | 100,000 + acres        | 8,502            | 2,026                         | 879         | 2,905             | 44       | 166             | 11,617        |
|                                                           | SubTotal               | 11,821           | 3,020                         | 1,296       | 4,316             | 74       | 347             | 16,558        |
| 2017 Totals:                                              |                        | 165,685          | 54,440                        | 89,034      | 143,474           | 22,722   | 3,743           | 335,624       |
| Percent of 2017 Harvest                                   |                        | 49.37%           | 16.22%                        | 26.53%      | 42.75%            | 6.77%    | 1.12%           | 100.00%       |
| 2016 Totals:                                              |                        | 175,057          | 47,645                        | 94,188      | 141,833           | 20,971   | 3,457           | 341,318       |
| Percent Change from 2016 to 2017:                         |                        | -5%              | 14%                           | -5%         | 1%                | 8%       | 8%              | -2%           |

## 2017 Precommercial Activities and Professional Assistance

| OwnershipTypeOwnership Size  |                        | Precommercial Activities<br>by Landowner Size and Type |         |       |                  |  | Number<br>of<br>Reported<br>Harvests | Licensed Forester<br>Involvement<br>by Landowner Size and Type |                |
|------------------------------|------------------------|--------------------------------------------------------|---------|-------|------------------|--|--------------------------------------|----------------------------------------------------------------|----------------|
|                              |                        | Acres                                                  |         |       |                  |  |                                      | Number of<br>Harvests                                          | Total<br>Acres |
|                              |                        | Herbicide Use                                          |         | TSI   | Tree<br>Planting |  |                                      |                                                                |                |
|                              |                        | Site Prep                                              | Release |       |                  |  |                                      |                                                                |                |
| Forest Industry Woodlands    | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 4                                    | 3                                                              | 75             |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                |  | 1                                    | 1                                                              | 23             |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 0                |  | 35                                   | 18                                                             | 1,311          |
|                              | 100,000 + acres        | 0                                                      | 10,428  | 7,035 | 4,530            |  | 110                                  | 89                                                             | 52,538         |
|                              | Subtotal               | 0                                                      | 10,428  | 7,035 | 4,530            |  | 150                                  | 111                                                            | 53,947         |
| Investor Timberlands         | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 0                                    | 0                                                              | 0              |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 0                |  | 0                                    | 0                                                              | 0              |
|                              | 1,001 to 100,000 acres | 0                                                      | 0       | 0     | 0                |  | 10                                   | 10                                                             | 2,998          |
|                              | 100,000 + acres        | 426                                                    | 307     | 250   | 93               |  | 129                                  | 128                                                            | 51,627         |
|                              | Subtotal               | 426                                                    | 307     | 250   | 93               |  | 139                                  | 138                                                            | 54,625         |
| Non-Industrial Land          | 1 to 100 acres         | 0                                                      | 81      | 158   | 50               |  | 1,968                                | 620                                                            | 17,408         |
|                              | 101 to 1,000 acres     | 29                                                     | 50      | 572   | 24               |  | 1,247                                | 503                                                            | 28,599         |
|                              | 1,001 to 100,000 acres | 0                                                      | 4       | 764   | 22               |  | 367                                  | 252                                                            | 26,294         |
|                              | 100,000 + acres        | 477                                                    | 773     | 0     | 2,691            |  | 270                                  | 248                                                            | 64,596         |
|                              | Subtotal               | 506                                                    | 908     | 1,494 | 2,787            |  | 3,852                                | 1,623                                                          | 136,897        |
| Other Woodlands (Govt, etc.) | 1 to 100 acres         | 0                                                      | 0       | 0     | 0                |  | 19                                   | 9                                                              | 297            |
|                              | 101 to 1,000 acres     | 0                                                      | 0       | 0     | 20               |  | 33                                   | 25                                                             | 1,266          |
|                              | 1,001 to 100,000 acres | 0                                                      | 20      | 0     | 0                |  | 24                                   | 21                                                             | 3,013          |
|                              | 100,000 + acres        | 0                                                      | 106     | 12    | 0                |  | 58                                   | 55                                                             | 10,539         |
|                              | Subtotal               | 0                                                      | 126     | 12    | 20               |  | 134                                  | 110                                                            | 15,115         |
| 2017 Totals:                 |                        | 932                                                    | 11,769  | 8,791 | 7,430            |  | 4,275                                | 1,982                                                          | 260,584        |
| 2016 Totals:                 |                        | 2,247                                                  | 13,464  | 3,724 | 6,677            |  | 4,665                                | 2,172                                                          | 258,506        |
| Change from 2016 to 2017:    |                        | -59%                                                   | -13%    | 136%  | 11%              |  | -8%                                  | -9%                                                            | 1%             |

335,624

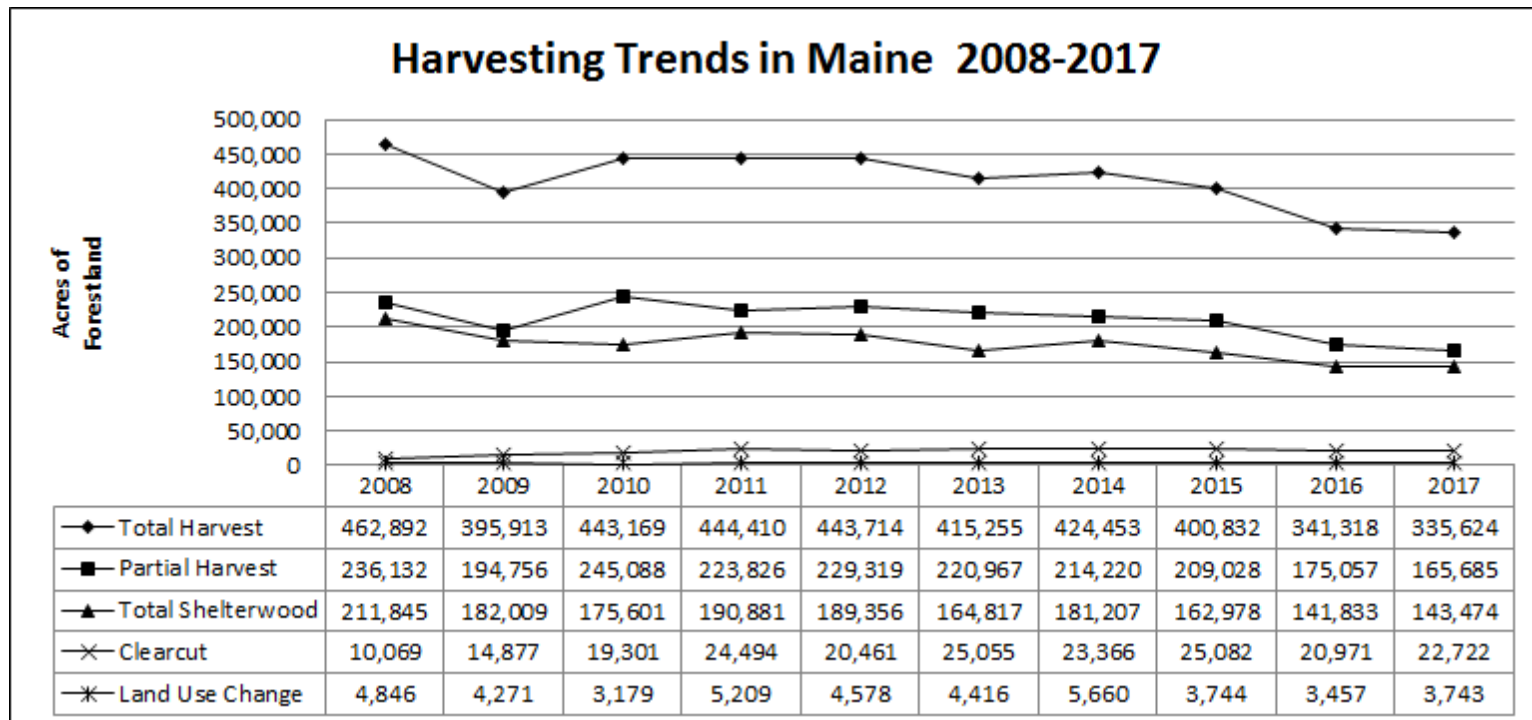
*Statewide Total  
Harvest acres from  
previous page*

341,318



**Definitions:**

- Ownership Type**
- Forest Industry Land:** Woodlands owned by a forest products industry; usually most of the wood harvested is used by that industry.
- Investor Timberlands:** Woodlands owned by organizations, including Timberland Investment Management Organizations (TIMOs) and Real Estate Investment Trusts (REITs) that hold timberland assets as fiduciaries for the benefit of others.
- Non-Industrial Land:** Woodlands privately owned but NOT by a forest industry. These include private individuals and other non-forest product industries.
- Other woodlands:** Woodlands owned by other entities not listed above -- including local, state, federal, or tribal governments.
- Types of Harvests**
- Partial Harvest:** Harvest where trees are removed individually or in small (<5 acre) patches.
- Shelterwood:** Harvest of mature trees from a forest site in two or more stages. The first stage removes only a portion of the trees to allow establishment of regeneration before the remaining trees are removed in subsequent harvest.
- Clearcut:** Harvest on a site larger than 5 acres that results in a residual basal area of acceptable growing stock trees >4.5" DBH of less than 30 square feet per acre, unless after harvesting the site has a well-distributed stand of acceptable growing stock 3 feet tall for softwood and 5 feet for hardwoods (Overstory Removal). Refer to the latest copy of the Maine Forest Service Rules Chapter 20 for additional information. It can be found on the Maine Forest Service website at [http://www.state.me.us/doc/mfs/rules\\_regs/index.htm](http://www.state.me.us/doc/mfs/rules_regs/index.htm)
- Change of Land Use:** Harvest conducted to convert forestland to another land use such as house lots, farm pastures, etc.



# 2017 Annual Report on Clearcutting and Precommercial Activities

Compiled from the 2017 Landowner Reports and other survey instruments. Data collected under the provisions of the Forest Resources Assessment Program, 12 MRS § 8878-A

| County       | Large Landowners (own >100,000 acres) |         |                              |       |                                              |       |       |       |           |           | All Other Landowners |         |           |           | All Landowners           |
|--------------|---------------------------------------|---------|------------------------------|-------|----------------------------------------------|-------|-------|-------|-----------|-----------|----------------------|---------|-----------|-----------|--------------------------|
|              | Precommercial Activities              |         | Clearcuts > 75 acres in size |       | Purpose for Clearcut (see explanation below) |       |       |       |           |           | <u>Acres</u>         |         |           |           |                          |
|              | <u>Acres</u>                          |         | #                            | Acres | 1                                            | 2     | 3     | 4     | Sub Total | Avg. Size | TSI                  | Planted | Clearcut  |           | <u>Acres</u><br>Clearcut |
|              | TSI                                   | Planted |                              |       |                                              |       |       |       |           |           |                      |         | Sub Total | Avg. Size |                          |
| Androscoggin | 0                                     | 0       | 0                            | 0     | 0                                            | 0     | 0     | 0     | 0         | 0         | 10                   | 0       | 53        | 11        | 53                       |
| Aroostook    | 5,291                                 | 4,451   | 0                            | 0     | 7,037                                        | 23    | 223   | 0     | 7,283     | 34        | 20                   | 20      | 213       | 11        | 7,496                    |
| Cumberland   | 0                                     | 0       | 0                            | 0     | 0                                            | 0     | 0     | 0     | 0         | 0         | 0                    | 0       | 37        | 9         | 37                       |
| Franklin     | 0                                     | 47      | 11                           | 2,140 | 2,409                                        | 225   | 908   | 0     | 3,542     | 49        | 66                   | 0       | 62        | 9         | 3,604                    |
| Hancock      | 0                                     | 0       | 0                            | 0     | 182                                          | 0     | 0     | 0     | 182       | 30        | 44                   | 0       | 231       | 14        | 413                      |
| Kennebec     | 0                                     | 0       | 0                            | 0     | 0                                            | 0     | 0     | 0     | 0         | 0         | 402                  | 0       | 12        | 6         | 12                       |
| Knox         | 0                                     | 0       | 0                            | 0     | 0                                            | 0     | 0     | 0     | 0         | 0         | 2                    | 0       | 30        | 8         | 30                       |
| Lincoln      | 0                                     | 0       | 0                            | 0     | 0                                            | 0     | 0     | 0     | 0         | 0         | 6                    | 0       | 0         | 0         | 0                        |
| Oxford       | 649                                   | 79      | 8                            | 1,512 | 1,315                                        | 716   | 796   | 0     | 2,827     | 38        | 30                   | 42      | 99        | 16        | 2,926                    |
| Penobscot    | 576                                   | 93      | 0                            | 0     | 724                                          | 0     | 0     | 0     | 724       | 48        | 37                   | 36      | 20        | 5         | 744                      |
| Piscataquis  | 531                                   | 465     | 0                            | 0     | 452                                          | 44    | 424   | 379   | 1,299     | 22        | 21                   | 5       | 15        | 15        | 1,314                    |
| Sagadahoc    | 0                                     | 0       | 0                            | 0     | 0                                            | 0     | 0     | 0     | 0         | 0         | 0                    | 0       | 7         | 2         | 7                        |
| Somerset     | 0                                     | 2,179   | 4                            | 441   | 3,662                                        | 0     | 258   | 1,236 | 5,156     | 22        | 49                   | 6       | 529       | 35        | 5,685                    |
| Waldo        | 0                                     | 0       | 0                            | 0     | 36                                           | 0     | 0     | 0     | 36        | 12        | 0                    | 7       | 35        | 9         | 71                       |
| Washington   | 250                                   | 0       | 1                            | 101   | 186                                          | 0     | 0     | 0     | 186       | 37        | 750                  | 0       | 76        | 13        | 262                      |
| York         | 0                                     | 0       | 0                            | 0     | 0                                            | 0     | 0     | 0     | 0         | 0         | 57                   | 0       | 68        | 11        | 68                       |
| State Total: | 7,297                                 | 7,314   | 24                           | 4,194 | 16,003                                       | 1,008 | 2,609 | 1,615 | 21,235    | 36        | 1,494                | 116     | 1,487     | 14        | 22,722                   |

## Purposes for creating clearcut:

1. Removal of poor quality, intolerant, under stocked, short lived or mature overstories where the retention of the residual overstory trees is not justified for further increase in value, as a source of seed, or for protection of the new stand.
2. Ecologically appropriate improvement or creation of wildlife habitat.
3. Removal of stands that, if partially harvested according to accepted silvicultural practice, are at high risk for windthrow due to factors such as soils, rooting depth, crown ratio or stem quality.
4. Harvesting of an existing plantation or other forest stand established by or previously treated with precommercial silvicultural activities.

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## Maine Forest Service District Foresters

### Oliver Markewicz

2281 Alfred Road  
Lyman, ME 04002  
Phone: (207) 441-3712  
E-mail: oliver.c.markewicz@maine.gov

### Morten Moesswilde

536 Waldoboro Road  
Jefferson, ME 04348  
Phone: (207) 441-2895  
E-mail: morten.moesswilde@maine.gov

### Vacant

P.O. Box 130  
Jonesboro, ME 04468  
Phone: (207) 287-2791  
E-mail:

### Terri Coolong

P.O. Box 415  
Old Town, ME 04468  
Phone: (207) 215-0679  
E-mail: terri.r.coolong@maine.gov

### Dan Jacobs

2 Forestry Road  
Island Falls, ME 04747  
Phone: (207) 441-4128  
E-mail: dan.jacobs@maine.gov

### Shane Duigan

356 Shaker Road  
Gray, ME 04039  
Phone: (207) 592-1251  
E-mail: shane.p.duigan@maine.gov

### Patty Cormier

PO Box 416  
Norridgewock, ME 04957  
Phone: (207) 592-2238  
E-mail: patty.cormier@maine.gov

### Adam Cates

P.O. Box 1107  
Greenville, ME 04441  
Phone: (207) 441-4139  
E-mail: adam.e.cates@maine.gov

### Mike Richard

131 Bethel Road  
West Paris, ME 04289  
Phone: (207) 441-3276  
E-mail: michael.b.richard@maine.gov

### Randy Lagasse

45 Radar Road  
Ashland, ME 04732  
Phone: (207) 557-1086  
E-mail: randy.lagasse@maine.gov

**Maine Forest Service - Main Office - Augusta** 1-800-367-0223 (instate) or 207-287-2791  
email: forestinfo@maine.gov

STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED SUPPLEMENTAL TESTIMONY AND EXHIBITS OF  
LAUREN JOHNSTON

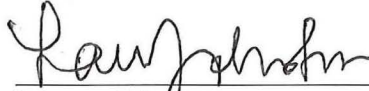
May 1, 2019

This testimony is in response to the questions and data requests in the Tenth Procedural Order. I hereby adopt the Pre-Filed Supplemental Testimony of Mark Goodwin as if it were my own.



Dated: 4/29/19

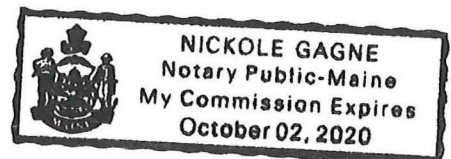
Respectfully submitted,

  
\_\_\_\_\_  
Lauren JohnstonSTATE OF MAINE  
CUMBERLAND, ss.  
COUNTY

The above-named Lauren Johnston did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Dated: 4/29/19

Before,

  
\_\_\_\_\_  
Notary PublicName: NICKOLE GAGNEMy Commission Expires: 10/02/20

STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

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Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

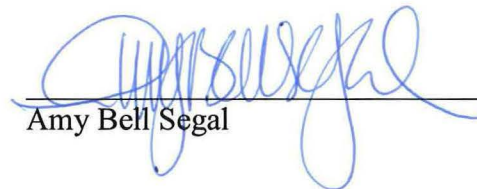
PRE-FILED SUPPLEMENTAL TESTIMONY AND EXHIBITS OF  
AMY BELL SEGAL

May 1, 2019

This testimony is in response to the questions and data requests in the Tenth Procedural Order. I hereby adopt the Pre-Filed Supplemental Testimony of Terrence J. DeWan as if it were my own.

Dated: 4/30/2019

Respectfully submitted,

  
Amy Bell Segal

STATE OF MAINE

York, ss.

The above-named Amy Bell Segal did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

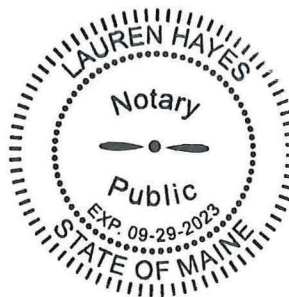
Before,

Dated: April 30, 2019

  
Notary Public

Name: Lauren Hayes

My Commission Expires: 9-29-23



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

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Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED SUPPLEMENTAL TESTIMONY AND EXHIBITS

OF TERRENCE J. DEWAN

May 1, 2019

This testimony is in response to question #16 of the Department of Environmental Protection's (DEP's) Tenth Procedural Order.

**QUESTION 16: LOCATIONS WHERE TAPERING VS. TALLER OVERHEAD POLES WOULD BE PREFERRED.**

CMP has proposed tapered vegetation management in certain areas (Upper Kennebec deer wintering area, south of Coburn Mountain, and the shoulder of Tumbledown Mountain) and

the use of taller structures to allow full height vegetation to remain at Gold Brook and Mountain Brook. Tapering is being specifically proposed to mitigate for potential visual impacts from Coburn Mountain and the shoulder of Tumbledown Mountain (as seen from Rock Pond). The taller structures being proposed at Gold Brook to address habitat issues resulted in greater Project visibility from Rock Pond; this was mitigated by tapering vegetation on the shoulder of Tumbledown Mountain to soften the edges of the transmission corridor (as depicted in the photosimulation from Rock Pond).

To the extent that additional tapering or taller transmission structures are being evaluated for habitat protection or other environmental considerations, tapering would be preferable to taller transmission poles in all locations identified by the interveners because of the potential for greater visual impacts associated with taller structures when viewed from lakes and ponds, roads, or elevated viewpoints.

TJD&A evaluated each of the nine priority areas for habitat connectivity identified by The Nature Conservancy (TNC), as shown on Exhibit 7 of TNC's pre-filed direct testimony, to determine whether either tapered vegetation or taller poles would be visible and the potential visual effect (positive or negative) of each. Please see Exhibit CMP-6.2-A.

### **TNC Area 1**

**Location:** Beattie Twp; Number 1 Brook; 1.63 miles from Structure 795 to 803.

**Resources with Potential Views:** Beattie Pond, a LUPC Remote Pond, east of Area 1.

**Roads:** Lowelltown Road.

**Potential Visual Effect:** The redesigned structures (included in the current application) are 38 feet lower than those originally proposed to minimize visibility from Beattie Pond. The use of taller structures in Area 1 would result in increased Project visibility from Beattie Pond. Tapered vegetation in Area 1 would not be visible from Beattie Pond. At the point where the Project crosses Lowelltown Road, a forest management road, tapered vegetation would limit views down



the corridor, which would minimize the visual effect and any impacts to the occasional recreational visitor.

### **TNC Area 2**

**Location:** Skinner Twp; 1.39 mile from Structure 765 to 771

**Resources with Potential Views:** South Branch Moose River; no lakes or ponds with views. No. 5 Mountain is approximately 8 miles to the east.

**Nearby Roads:** Gold Brook Road

**Potential Visual Effect:** Two structures (Structures 767 and 768) adjacent to the South Branch of the Moose River were evaluated to determine if increasing their height to allow taller vegetation would result in potential visual impacts from the river. The taller vegetation would minimize views of the structures from the river; the conductors would be visible at a higher elevation than currently proposed. Tapering in the remaining portion of TNC Area 2 would not be visible from any scenic resources.

The taller structures would not be visible from any publicly owned scenic resources. At a distance of 8 miles, the view from No. 5 Mountain would not be affected. There may be some visibility on Tumbledown Mountain, which is privately owned with no trails.

Tapering and the preservation of full height vegetation would limit views down the corridor, which would minimize the visual effect and any impacts to recreational users on Gold Brook Road. Second growth vegetation adjacent to Gold Brook Road is currently 20-30± feet in height.

### **TNC Area 3**

**Location:** Skinner Twp, Appleton TWP 3 1.23 miles from Structure 752 to 758

**Resources with Potential Views:** unnamed perennial streams w/associated intermittent tributaries; Tumbledown Mountain (located south of this area on private land).

**Nearby Roads:** Spencer Road is 2± miles to north and east. The area is near Pine Tree Road and several other dead-end haul roads.

**Potential Visual Effect:** Taller structures would not be visible from Rock Pond (5.0 miles away) or Number 5 Mountain (6.5 miles away) due to intervening topography. Taller structures may be visible from surrounding mountains on private lands, e.g., Tumbledown Mountain and Leroy Mountain (neither of which have established trails). The only roads in Area 3 are dead-end forest management roads. Tapering would have no effect on views from Spencer Road, which is 2± miles from this area.

### **TNC Area 4**

**Location:** Appleton TWP; 3.15 miles from Structure 725 to 743

**Resources with Potential Views:** Gold Brook and tributaries; Rock Pond; perennial streams flowing into Rock Pond and Iron Pond.

**Nearby Roads:** Spencer Road; Rock Pond access road.

**Potential Visual Effect:** The application includes the use of taller structures, full height vegetation, and tapered vegetation in a concentrated area around Gold Brook. Increasing the heights of the structures closest to Rock Pond (725, 726, and 727) by 30 to 45 feet above those currently proposed would make them much more visible from the pond. These three taller structures would be farther away from the grouping of taller structures seen in the vicinity of a pronounced notch between Tumbledown Mountain and Greenlaw Mountain in the application, and would extend the area of visual effect as seen from Rock Pond.

While these three structures are approximately twice as tall as the coniferous trees that line the shoreline, from most locations on the pond they would be seen against a wooded hillside backdrop. There may be some locations near the northern end of the pond where these three structures would be silhouetted against the sky, and would thus be more prominent visually.

The conductors for taller structures 725, 726, and 727 would be highly visible from the pond, even with the use of non-specular conductor, since they would be seen as unbroken lines connecting the structures.

Taller vegetation between Structures 726 and 727 resulting from taller structures would prevent views down the transmission corridor, which would minimize the effect of right-of-way clearing to recreational users going to the boat launch on the northwest end of the pond and those driving to the campsites on the northern end of the pond. Tapered vegetation in this area would also minimize visual effects to recreational users.

The use of tapered vegetation in the vicinity of TNC Area 4 would minimize visual effects to recreational users on Spencer Road.

## **TNC Area 5**

**Location:** Hobbstown Twp, TR7 BKP WKR, Bradstreet Twp; 4.22 miles from Structure 683 to 704.

**Resources with Potential Views:** Toby Pond, unnamed pond, Whipple Pond (rated Significant), Whipple Brook, Bitter Brook, Moose River tributary, Moore Pond, Egg Pond

**Nearby Roads:** Spencer Road, Spencer Rips Road.

**Potential Visual Effect:** Three groups of taller structures were evaluated: Structures 701–704 north of Toby Pond, Structures 693 and 694 adjacent to Whipple Brook and east of Whipple Pond, and Structures 684–688 north of Moore Pond and Egg Pond.

Toby Pond: at least two taller structures would be visible from portions of Toby Pond, which is not a rated waterbody. At a height of 130 feet, Structure 702 would be silhouetted against the

sky. The use of tapered vegetation in the vicinity of Structure 702 and 703 would be preferred over taller structures.

**Whipple Brook/Whipple Pond:** Taller structures (693 and 694) would preserve full height vegetation adjacent to Whipple Brook and elevate the conductors a greater distance above the stream. None of the taller structures evaluated would be visible from Whipple Pond. Either tapering or the use of taller structures would minimize visual effects to camp owners and recreational users on Spencer Rips Road. Spencer Road is located at varying distances to the south and would not be affected by either tapering or taller structures in this area.

**Moore Pond:** Moore Pond is not a rated waterbody, but it has a public boat launch and is surrounded by Bureau of Parks and Lands property. Taller structures or tapered vegetation in this location would be not visible from Moore Pond due to topography and intervening vegetation.

### **TNC Area 6**

**Location:** Bradstreet Twp, Parlin Pond Twp, Johnson Mountain Twp; 2.45 miles from Structure 649 to 656.

**Resources with Potential Views:** Coburn Mountain, Parlin Stream, and 2 other perennial streams.

**Nearby Roads:** Spencer Road.

**Potential Visual Effect:** Tapered vegetation would be preferred in this area over taller structures to minimize potential adverse effects on the view from Coburn Mountain, from which the Project is currently minimally visible. Taller structures would elevate the conductors above the treeline where they would be more noticeable.

The use of tapered vegetation, already proposed by CMP in the Rusty Blackbird habitat adjacent to Spencer Road, will minimize visual effects to recreational users.

### **TNC Area 7**

**Location:** Johnson Mountain Twp; 0.72 mile from Structure 639 to 643.

**Resources with Potential Views:** Coburn Mountain, Parlin Pond, ITS 89.

**Nearby Roads:** Route 201.

**Potential Visual Effect:** Taller poles in TNC Area 7 were not evaluated because this area lacks known brook trout and threatened and endangered species waterbodies. Tapered vegetation would be preferred over taller structures in this area to minimize potential adverse effects on the view from Parlin Pond and Route 201. The Project in Area 7 is not visible from the summit of Coburn Mountain.

### **TNC Area 8**

**Location:** Johnson Mountain Twp, West Forks; 3.71 miles from Structure 564 to 585.

**Resources with Potential Views:** Tomhegan Stream and 3 perennial tributaries, Cold Stream Forest Parcel.

**Nearby Roads:** Wilson Hill Road.

**Potential Visual Effect:** Taller structures on either side of Tomhegan Stream would preserve taller vegetation adjacent to the stream and elevate the conductors a greater distance above the stream. The taller structures would not be visible from the stream due to preserved vegetation.

Tapering would minimize visual effects to recreational users on Wilson Hill Road where the Project corridor is near the road. Taller structures would be more visible to recreational users of the road due to the presence of commercial forestry operations on the northeast side of the road.

The Cold Stream Forest Parcel is located on the southwest side of Wilson Hill Road. The Project is not visible from Cold Stream within the Cold Stream Forest Parcel in the vicinity of Wilson Hill Road.

### **TNC Area 9**

**Location:** West Forks; 3.68 miles from Structure 540 to 554.

**Resources with Potential Views:** Kennebec River, Moxie Stream.

**Nearby Roads:** Fish Pond Road.

**Potential Visual Effect:** CMP, working with IF&W, has already proposed tapering in specific locations within the upper Kennebec deer wintering area portion of TNC Area 9. Riparian buffers are proposed adjacent to Moxie Stream. The forestland on either side of the Kennebec River will be preserved through the use of Horizontal Directional Drill (HDD) technology.

Tapered vegetation would be preferred over taller structures in this location. Taller structures would be more visible from Moxie Stream, specifically from a wetland area east of the stream crossing.

The use of tapered vegetation would minimize visual effects to recreational users on Fish Pond Road.


### **Exhibits**

CMP-6.2-A: Evaluation of TNC Priority Areas

Dated:

April 30 2019

Respectfully submitted,

  
\_\_\_\_\_  
Terrence J. DeWan

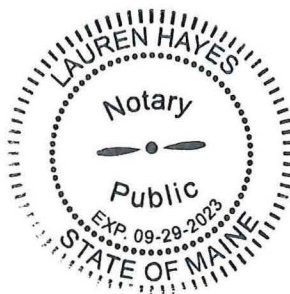
STATE OF MAINE

York, ss.

The above-named Terrence J. DeWan did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Before,

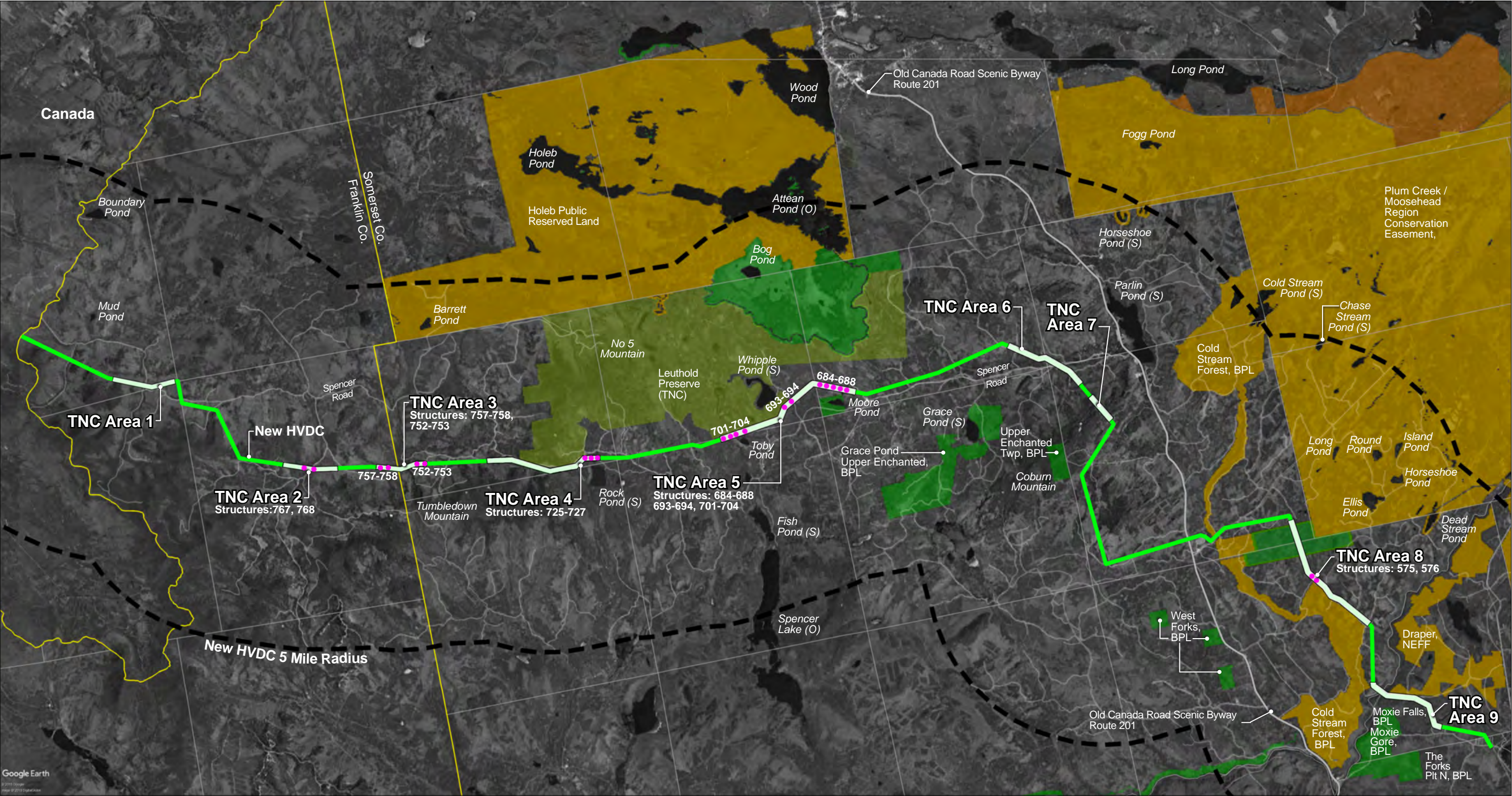
Dated:

April 30, 2019  
\_\_\_\_\_  
Notary PublicName: Lauren HayesMy Commission Expires: 9-29-23



PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Areas 1-9: Context Aerial Image

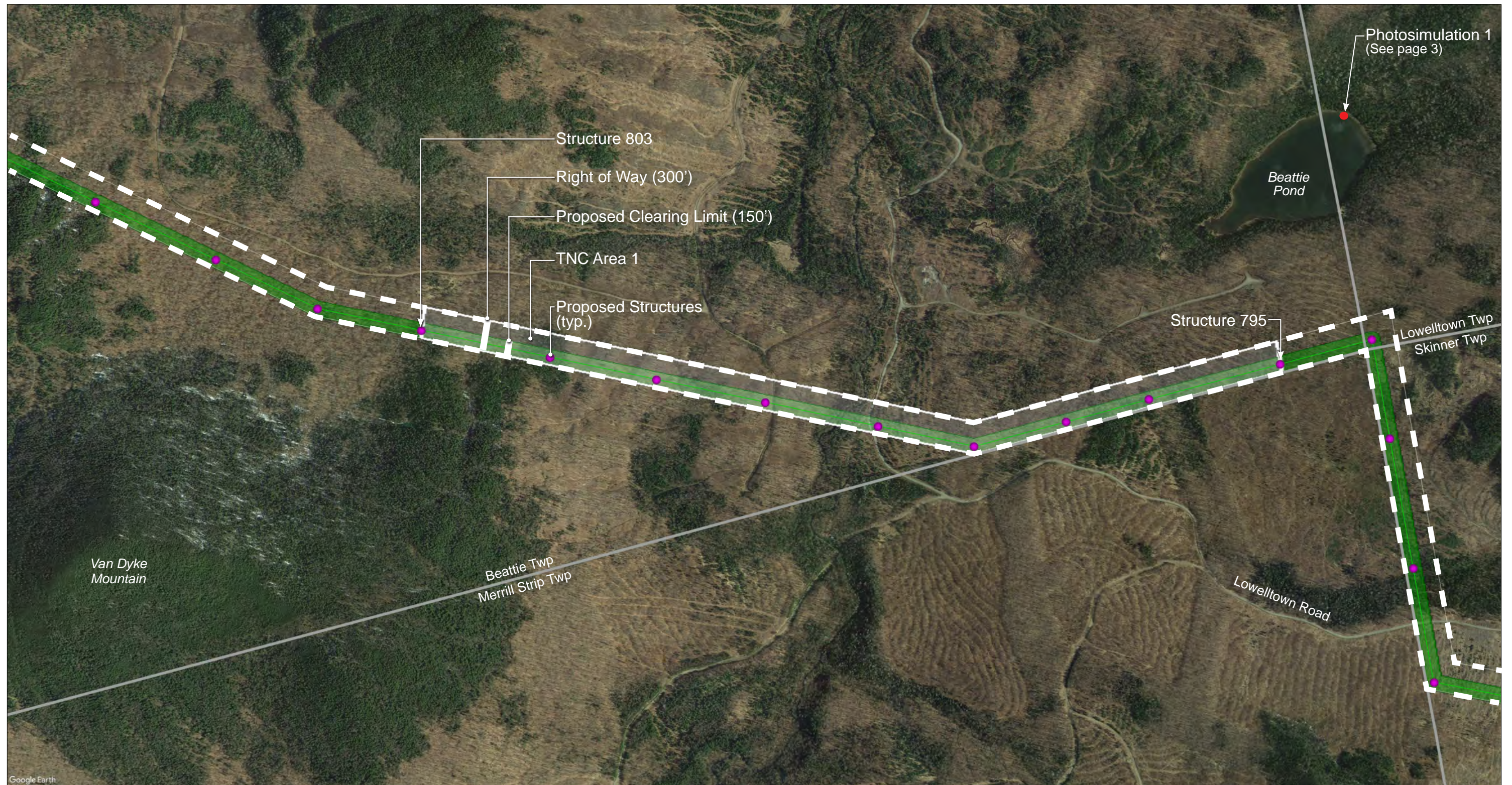


Pink circles within each TNC area represent taller structures that have been evaluated for potential visual impacts.



# PRIORITY AREAS FOR HABITAT CONNECTIVITY

## TNC Area 1: Context Aerial Image



The use of taller structures in TNC Area 1 would result in increased Project visual impact from Beattie Pond. Tapering within this area would not be visible from Beattie Pond. Tapering would be effective in limiting visibility down the Project corridor from Lowelltown Road (private forest management road).





**PRIORITY AREAS FOR HABITAT CONNECTIVITY****TNC Area 1: PHOTOSIMULATION 1: BEATTIE POND, Lowelltown Twp.****Beattie Pond, Lowelltown Twp**

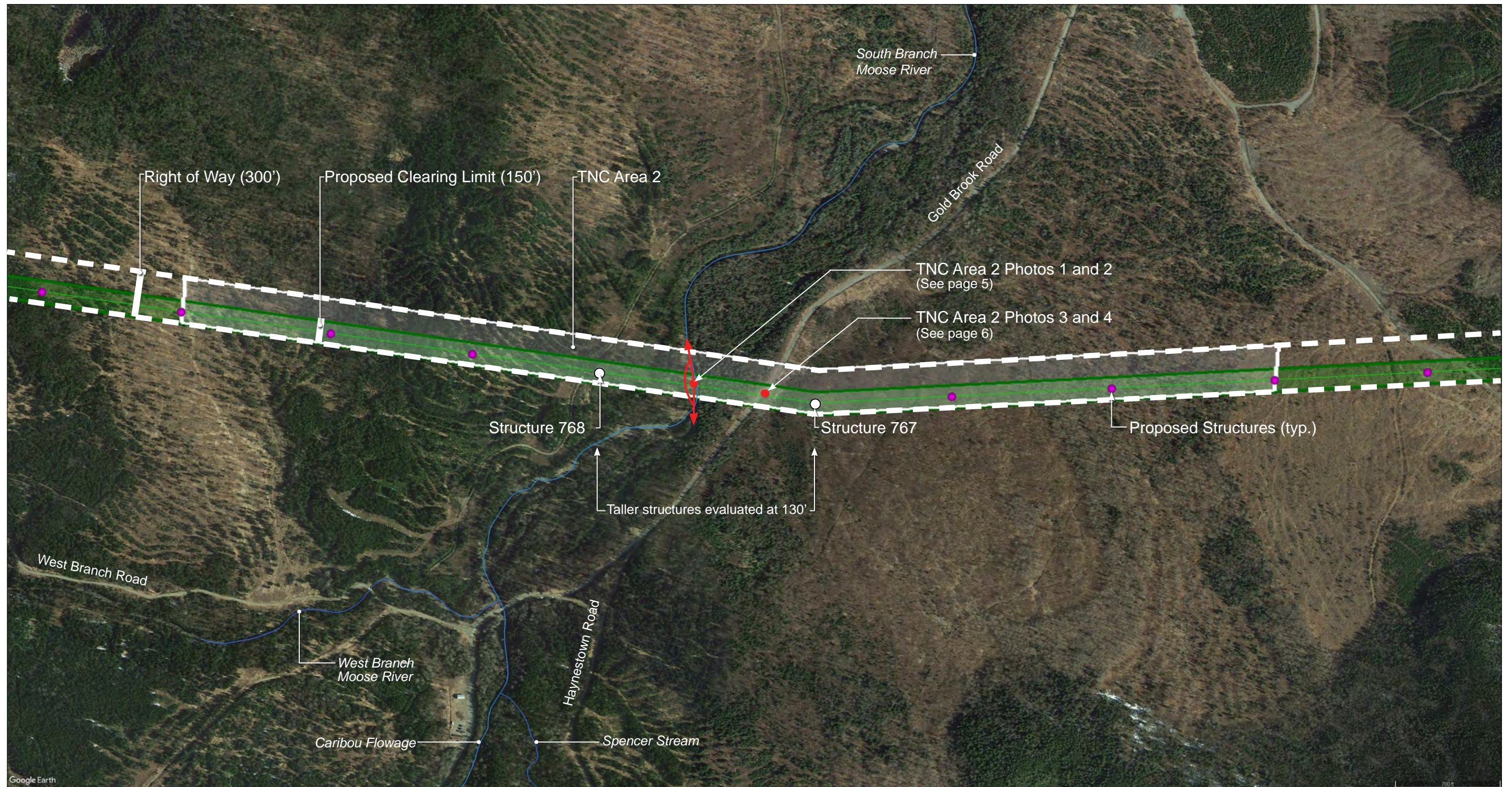
Previously submitted photosimulation from Beattie Pond looking southwest toward the re-engineered structures closest to the Pond. The tapered section of corridor in TNC Area 1 would not be visible from Beattie Pond. The use of taller structures in this area would result in increased Project visual impact from Beattie Pond.





# PRIORITY AREAS FOR HABITAT CONNECTIVITY

## TNC Area 2: Context Aerial Image



Taller structures (with full height vegetation) were evaluated in between Structure 767 and 768 within TNC Area 2, on either side of the South Branch of the Moose River. Full height vegetation preserved on either side of the South Branch of the Moose River would screen taller structures from view. The conductors would be visible overhead. The taller structures evaluated would not be visible from any publicly owned scenic resources. Tapering and the preservation of full height vegetation would limit views down the corridor, which would minimize the visual effect to recreational users on Gold Brook Road.





PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Area 2: Context Photographs

South Branch of Moose River, Skinner Township



**TNC Area 2 Photo 1:** Panoramic photograph looking south to southwest from the shoreline of the South Branch of the Moose River in Skinner Township. See page 4 for approximate location. Preserved riparian vegetation would block views of taller structures.



**TNC Area 2 Photo 2:** Panoramic photograph looking west to northwest from the shoreline of the South Branch of the Moose River. Preserved riparian vegetation would block views of taller structures.



## PRIORITY AREAS FOR HABITAT CONNECTIVITY

### TNC Area 2: Context Photographs

#### Gold Brook Road, Skinner Township



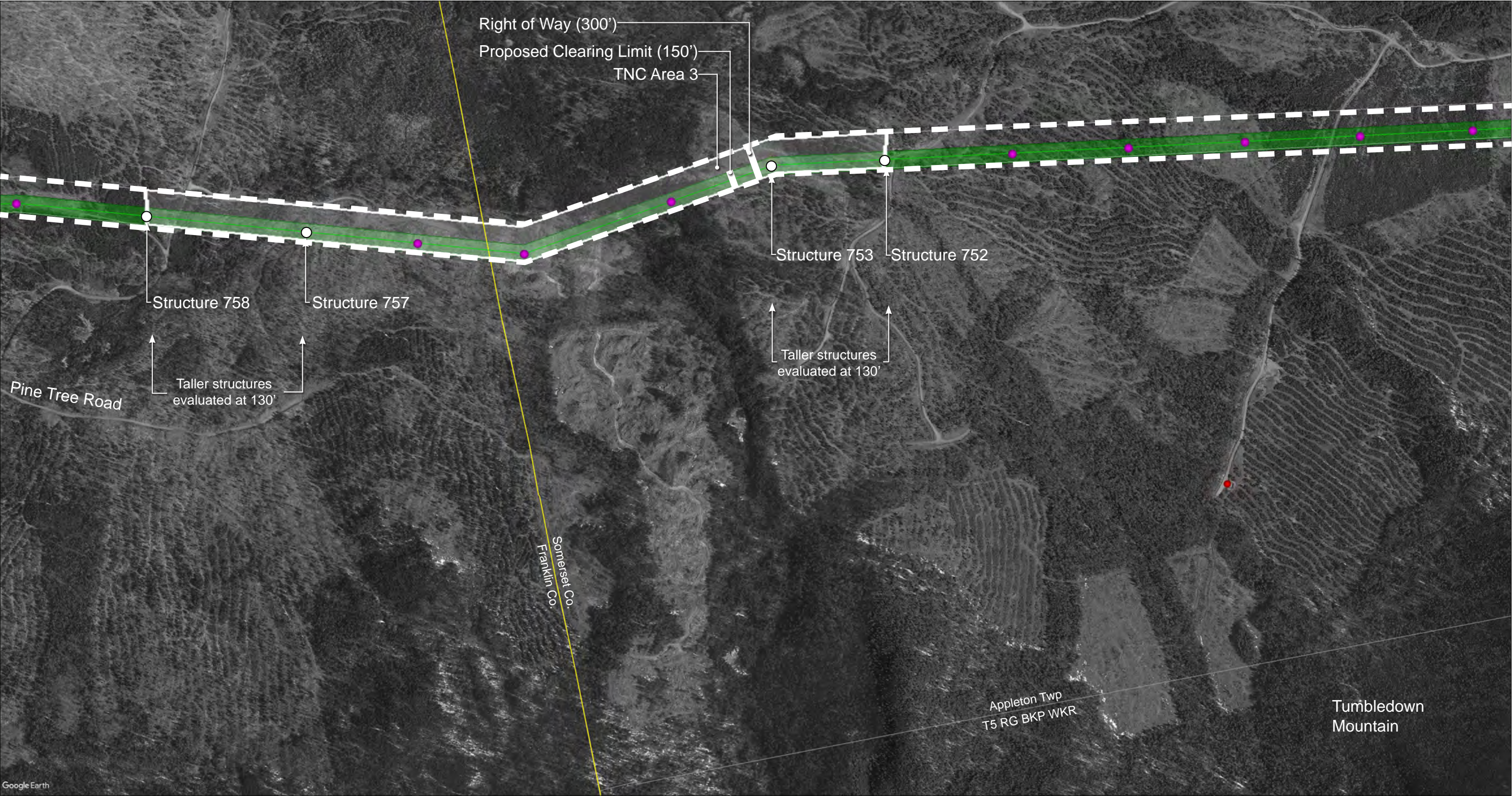
**TNC Area 2 Photo 3:** Photograph looking southwest from Gold Brook Road in Skinner Township. See page 4 for approximate location.



**TNC Area 2 Photo 4:** Photograph looking northeast from Gold Brook Road.



PRIORITY AREAS FOR HABITAT CONNECTIVITY  
TNC Area 3: Context Aerial Image

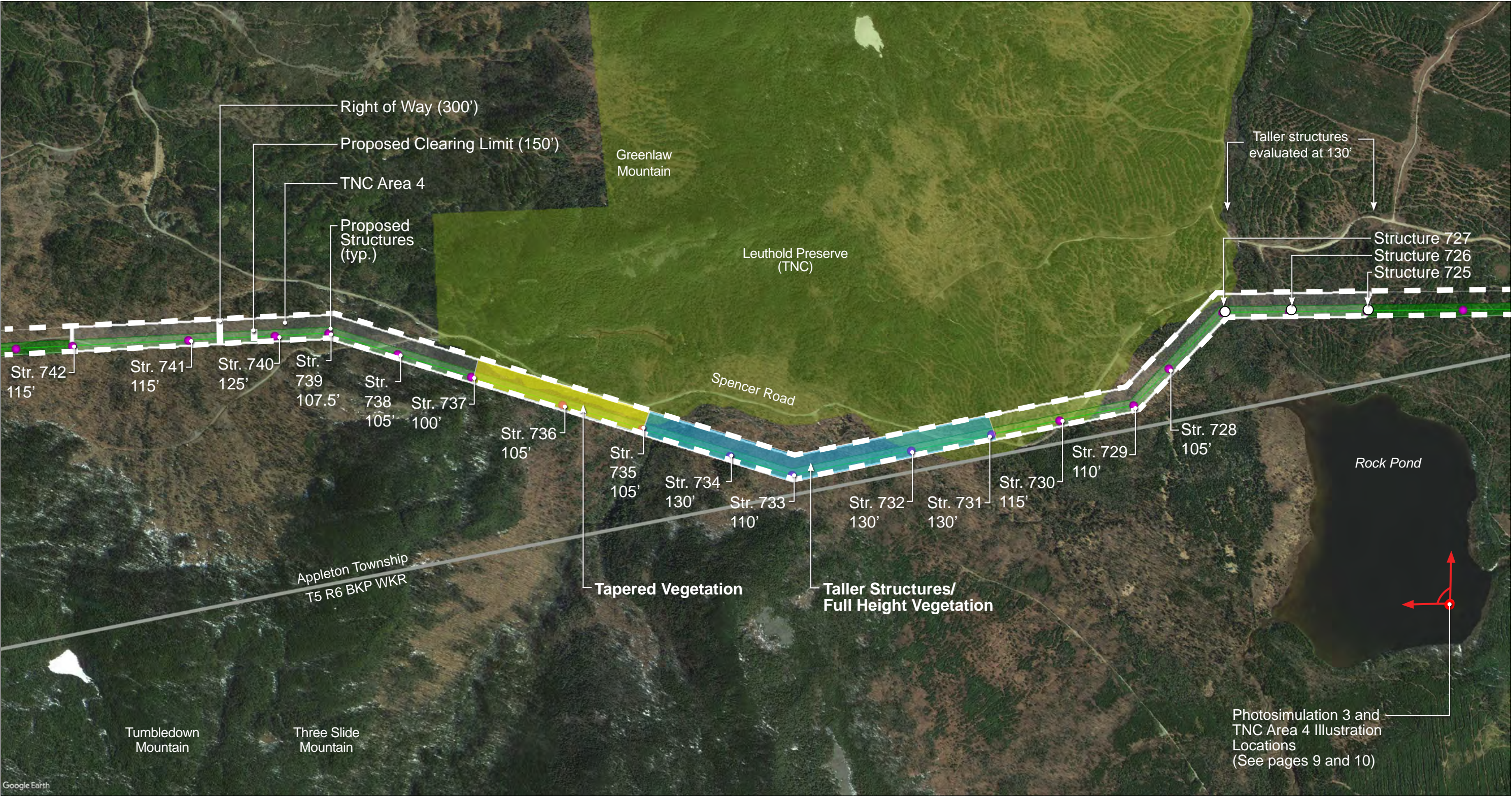


Taller structures may be visible from surrounding mountains on private lands, e.g., Tumbledown Mountain and Leroy Mountain. Tapering would have no appreciable effect on scenic quality in TNC Area 3.



PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Area 4: Context Aerial Image

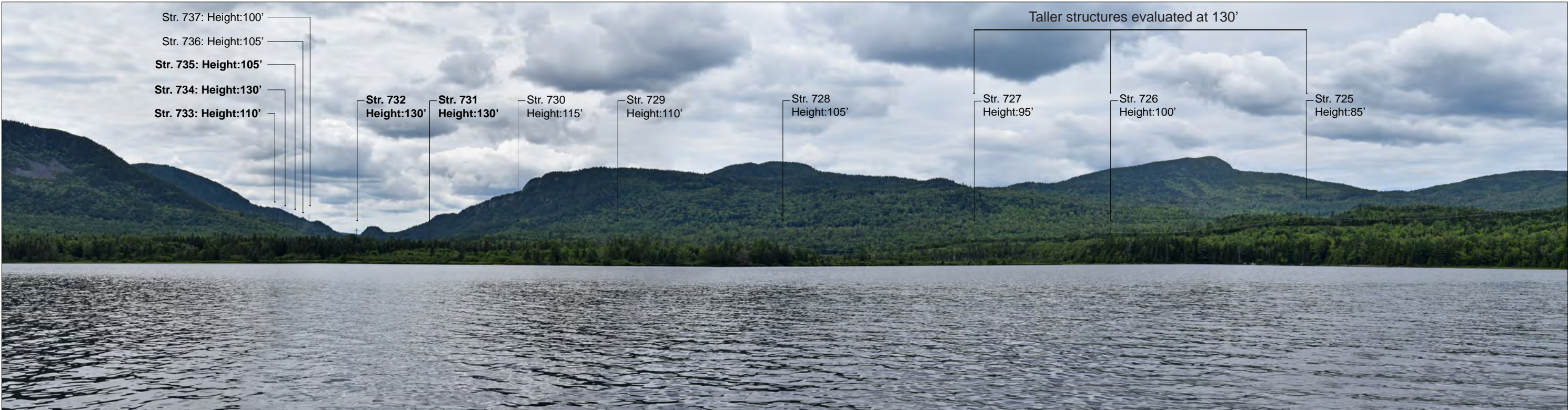




PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Area 4: PHOTOSIMULATION 3: ROCK POND, T5 R6 BKP WKR, PREVIOUSLY SUBMITTED

Rock Pond, T5 R6 BKP WKR



**Previously submitted photosimulation:** Panoramic view looking west to north from the southeast end of Rock Pond toward the proposed HVDC transmission line. Approximately twelve structures, conductors, and portions of the cleared corridor will be visible at distances of 0.7 to 2.5 miles from this viewpoint. Visible mountains from left to right: Three Slide Mountain, Tumbledown Mtn, Greenlaw Mountain, No. 6 Mountain, and No. 5 Mountain.

This simulation reflects the change in height for five structures in proximity to Gold Brook on the northern shoulder of Three Slide Mountain. Full vegetation height will be preserved for approximately 4,269 feet of corridor to maintain habitat between Structures 731 and 735 (**bold**). An additional 2,059 feet of corridor on the northern shoulder of Tumbledown Mountain would be maintained using a tapering vegetation management between Structures 735 and 737 which allows vegetation at heights ranging from 15 feet to 35 ft to be preserved along both sides within the corridor. This mitigation would minimize the visual ‘notch’ potentially viewed from Rock Pond.

*The individual structure heights noted reflect the current design (taller structures/full height vegetation near Gold Brook and tapering on Tumbledown). Structures 725, 726, and 727 were evaluated at 130', with full height vegetation in between.*

LOCATION MAP

CONTEXT MAP

TECHNICAL INFORMATION

| Typical Cross Section                                     |  | Photograph / Photosimulation Information          |                         |
|-----------------------------------------------------------|--|---------------------------------------------------|-------------------------|
| <p>Example of Tapered Vegetation Management Technique</p> |  | Location                                          | 45.457577°, -70.387233° |
|                                                           |  | Viewing Direction                                 | West to North           |
|                                                           |  | Horizontal Angle of View                          | 94°                     |
|                                                           |  | Date and Time                                     | 07/25/17 at 2:29 pm     |
|                                                           |  | Camera Focal Length                               | 35 mm                   |
|                                                           |  | Camera Make/Model                                 | Nikon D5500             |
|                                                           |  | Photo Source                                      | TJD&A                   |
|                                                           |  | Proposed Structures Visible                       | 12                      |
|                                                           |  | Approximate Distance to Nearest Visible Structure | 0.7 miles               |
|                                                           |  |                                                   |                         |
| <div><div></div><div></div><div></div></div>              |  |                                                   |                         |
| April 30, 2019                                            |  | PAGE 9 OF 25                                      |                         |



PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Area 4: PHOTOSIMULATION 3B: ROCK POND, T5 R6 BKP WKR

Rock Pond



**Previously submitted photosimulation:** Normal view looking north from southeast end of Rock Pond toward the proposed HVDC transmission line. structures, conductors, and portions of the cleared corridor will be visible at distances of 0.6 to 0.8 miles.

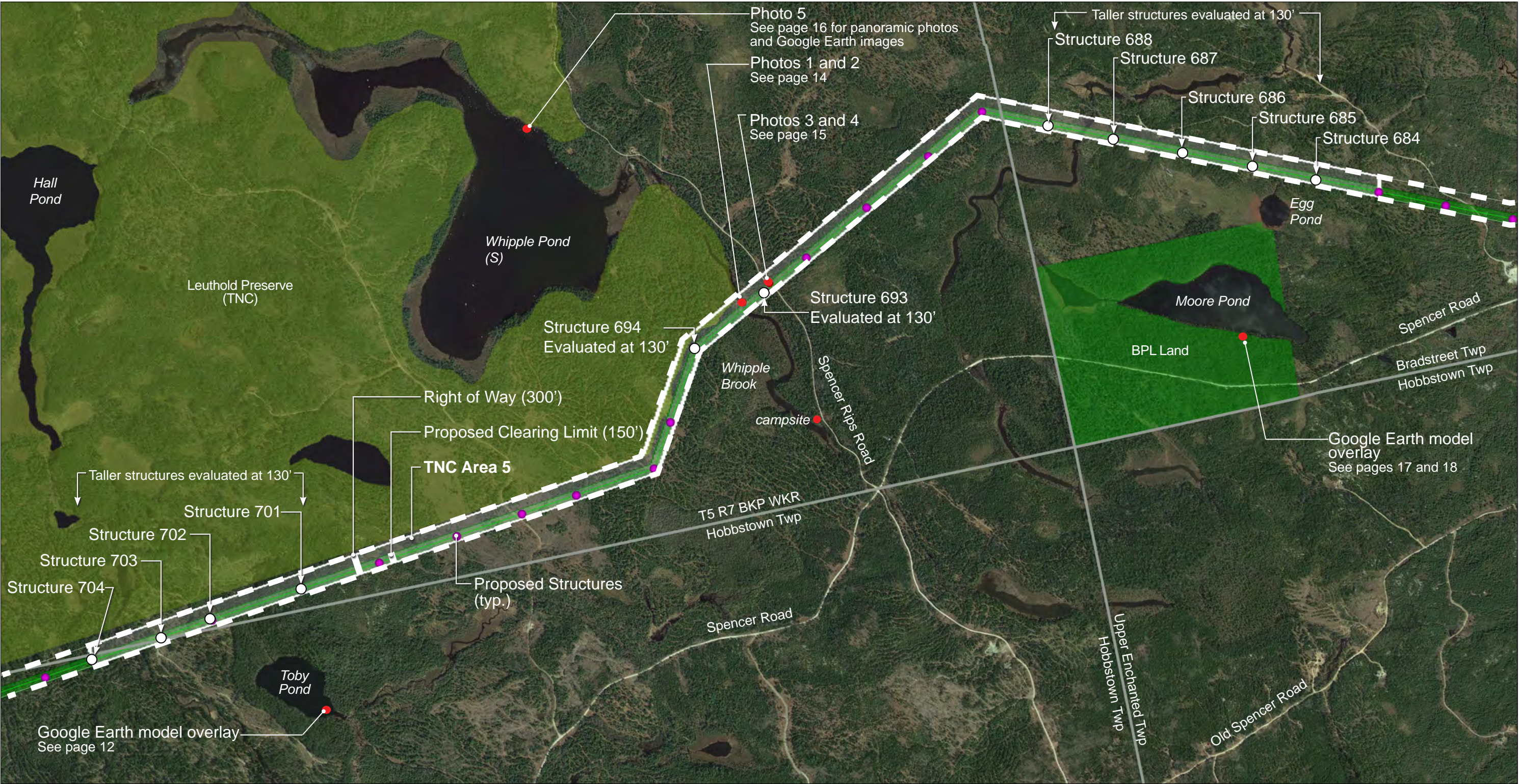
Submitted September 22, 2017

Taller structures would result in greater Project visibility of the conductors and Structures 725, 726, and 727 (closest to Rock Pond). Tapering would reduce the visible change in vegetation color and texture created by corridor clearing.



PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Area 5: Context Aerial Image



At least two structures (702 and 703) would be visible from portions of **Toby Pond**. Structure 702 would be silhouetted against the sky. The use of tapered vegetation in the vicinity of Structure 702 and 703 would be preferred.

Two taller structures near **Whipple Brook** would preserve taller vegetation adjacent to the brook and elevate the conductors a greater distance above the brook. None of the taller structures evaluated would be visible from **Whipple Pond**. Either tapering or the use of taller structures would minimize visual effects to camp owners and other recreational users on Spencer Rips Road. Spencer Road is located at varying distances to the south and would not be affected by either tapering or taller structures in this area.

Moore Pond is not a rated waterbody, but it has a public boat launch and is surrounded by Bureau of Parks and Lands property. Taller structures or tapered vegetation in this location would be not visible from **Moore Pond** due to topography and intervening vegetation.

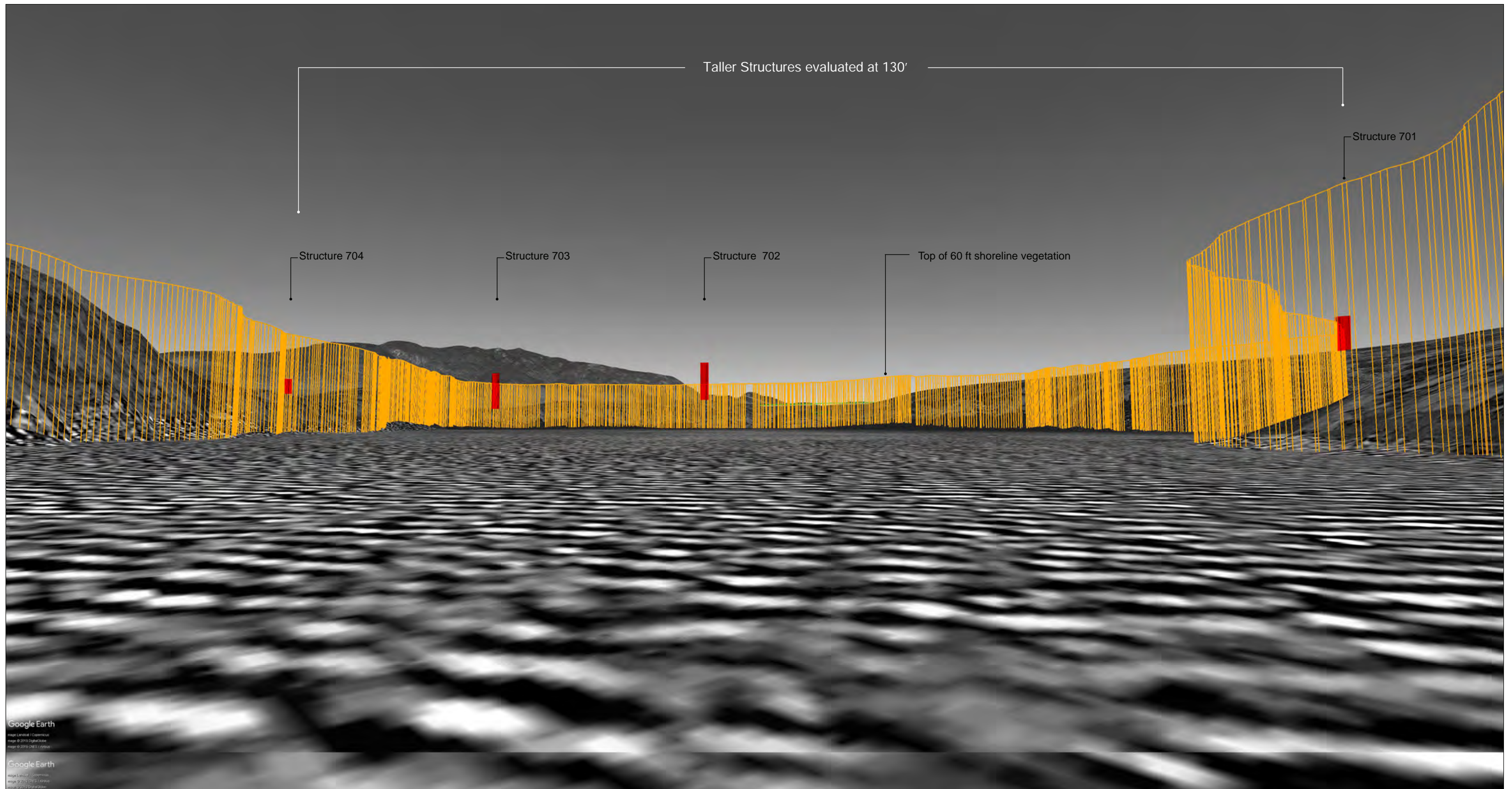




## PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Area 5: Google Earth Image

Toby Pond, Hobbstown Twp.



Google Earth model image illustrating a view looking northwest from Toby Pond in Hobbstown Twp. Structures 701-704, evaluated at 130 ft to allow full height vegetation, are shown as red lines. Shoreline vegetation (indicated with 60 ft orange lines) and topography would block views of proposed Structures 701 and 704. The tops of Structures 703 and 702 would be visible above the 60' shoreline vegetation surrounding the pond. See page 11 for location of pond and structures.



PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Area 5: Context Photographs and Google Earth Images

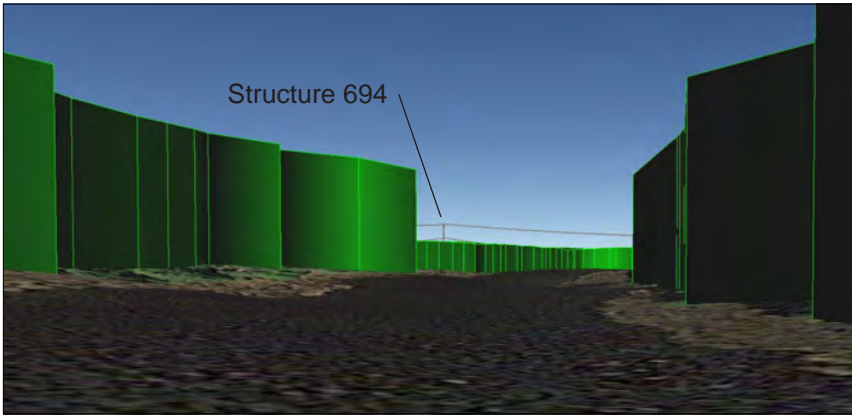
Visibility Review from Whipple Brook Campsite, T5 R7 BKP WKR, 2018.12.21



Viewpoint A from a campsite on Whipple Brook, off Spencer Rips Road in T5 R7 BKP WKR. The Project is unlikely to be visible from within the campsite but one structure and a portions of the conductors may be visible from the stream in front of the campsite

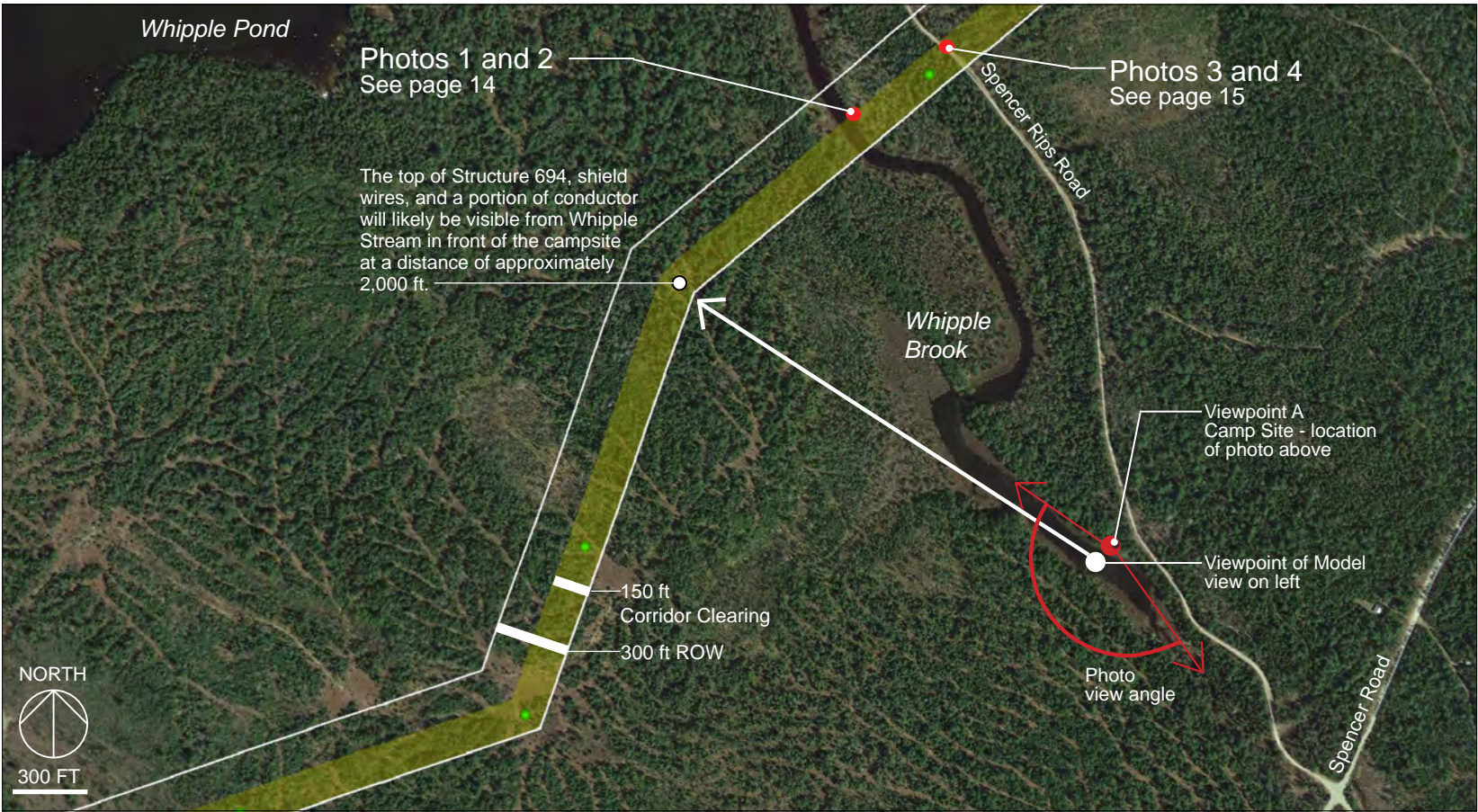


View of campsite on the northeast side of Whipple Brook, approximately 1,425 feet north of the Spencer Rips Road/Spencer Road intersection. Photo Date: 6/14/17



3D Model view from Whipple Brook in front of the campsite indicates that existing 40 ft +/- vegetation along the stream will screen the majority of the Project from views, except for the top of one structure (#694) and portions of shield wires and conductors.

*If Structure 694 were to be 130 feet, it would be more noticeable from Whipple Brook in front of the campsite.*





PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Area 5: Context Photographs

Whipple Brook at Project Crossing, T5 R7 BKP WKR



**Photo 1:** Panoramic photograph looking southeast to southwest from the shoreline of Whipple Brook at the Project crossing. The brook is approximately 50 feet wide in this location. (See page 11 for approximate location.) Structure 694 would be approximately 970 feet from this viewpoint. Structure 693 would be approximate 370 feet in the opposite direction from this location. Full height vegetation associated with taller structures would block views of both structures. Conductors would be visible overhead.



**Photo 2:** Panoramic photograph looking east to north from the shoreline of Whipple Brook at the Project crossing. The brook is approximately 50 feet wide in this location. Structure 694 would be approximately 970 feet from this viewpoint. Structure 693 would be approximate 370 feet in the opposite direction from this location. Full height vegetation associated with taller structures would block views of both structures. Conductors would be visible overhead.



PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Area 5: Context Photographs

Spencer Rips Road, T5 R7 BKP WKR



Photo 3: Panoramic photograph looking northwest from Spencer Rips Road in T5 R7 BKP WKR at the Project crossing.



Photo 4: Panoramic photograph looking southeast from Spencer Rips Road in T5 R7 BKP WKR at the Project crossing.

Either tapering or the use of taller structures would minimize visual effects to camp owners and recreational users on Spencer Rips Road.



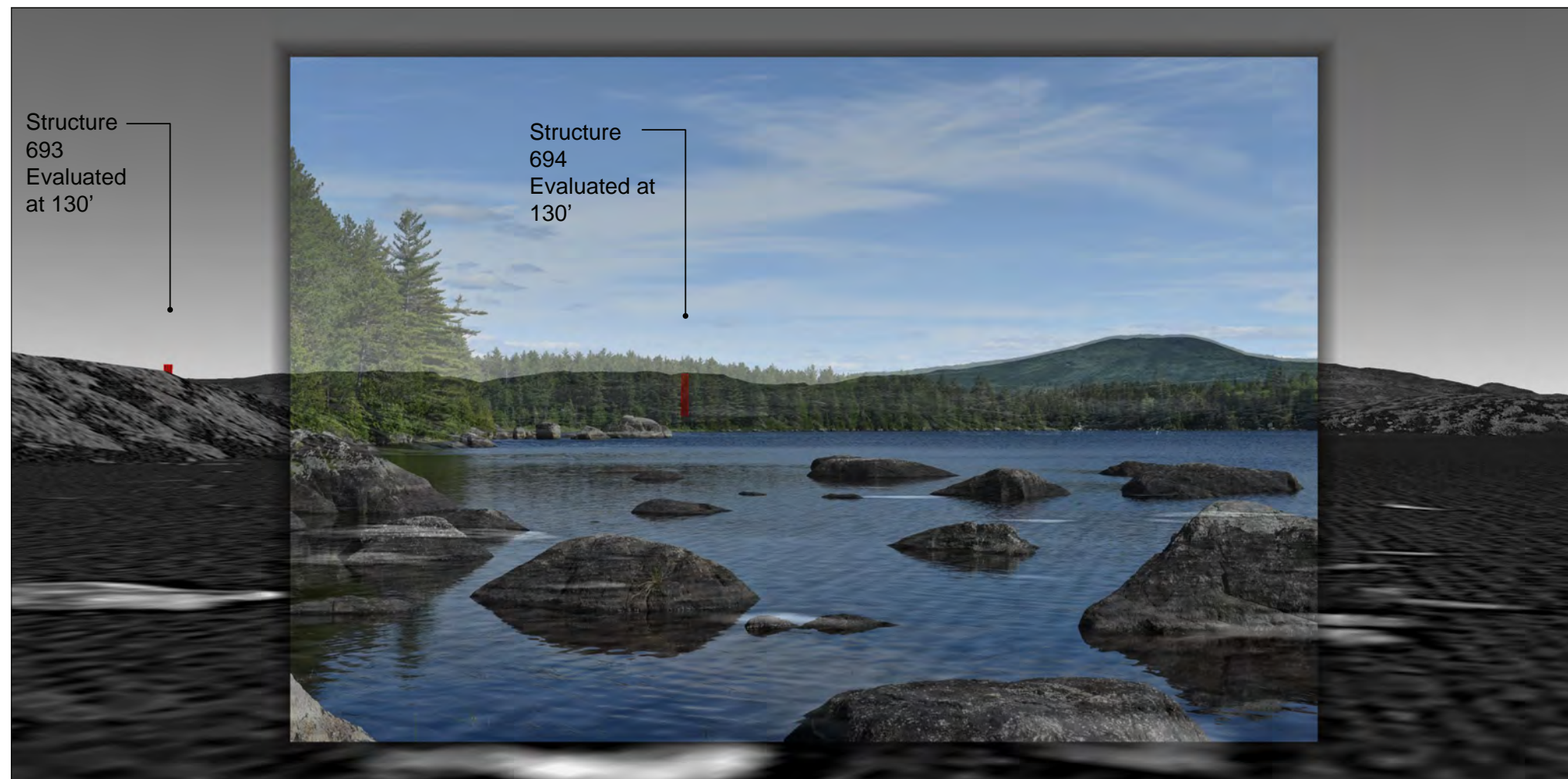
## PRIORITY AREAS FOR HABITAT CONNECTIVITY

### TNC Area 5: Context Photograph and Google Earth PhotoOverlay

#### Whipple Pond, T5 R7 BKP WKR



**Photo 5:** Panoramic photograph looking southeast to southwest from the north end of Whipple Pond. The current Project will not be visible from Whipple Pond.



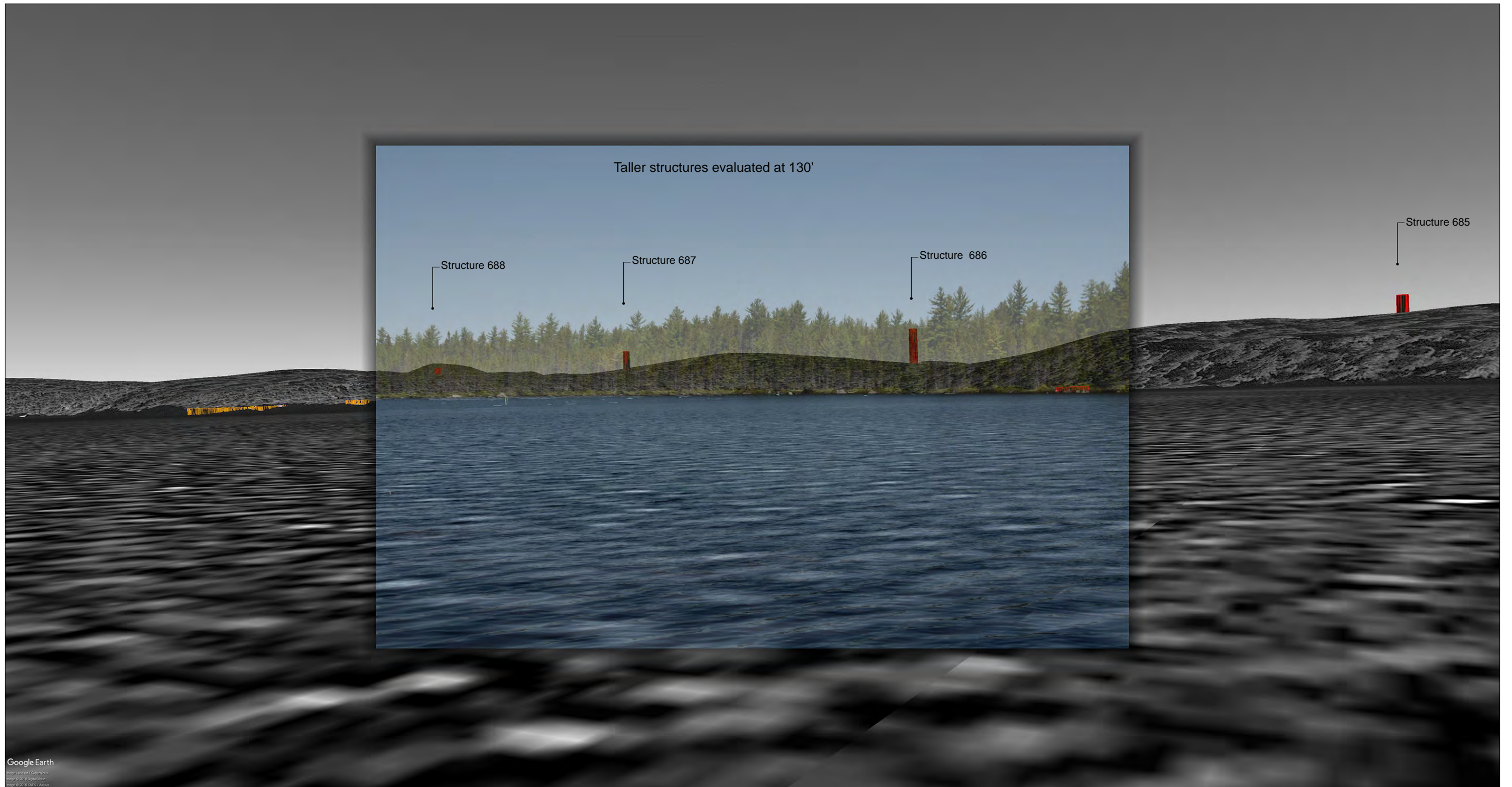
Google Earth overlay image illustrating view looking southeast from Whipple Pond. Shoreline vegetation and topography would block views of Structures 693 and 694 evaluated at 130 feet from the pond.



# PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Area 5: Google Earth Image

Moore Pond, Bradstreet Twp



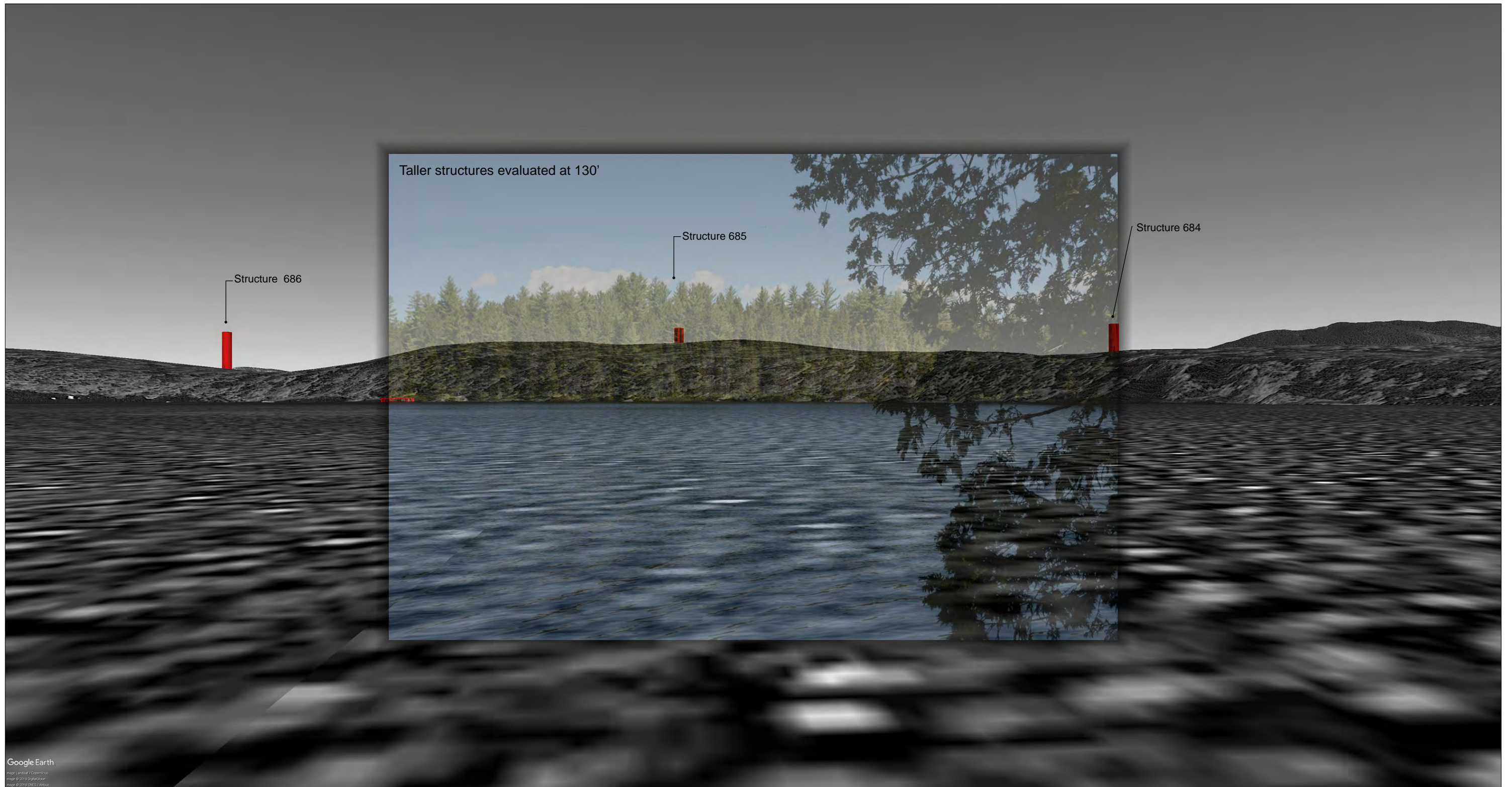
Google Earth photo overlay image illustrating a view looking north from Moore Pond. Structures 684 - 688, evaluated at 130 feet, are shown as red lines. Intervening shoreline vegetation and topography would block views of taller structures.



# PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Area 5: Google Earth Image

Moore Pond, Bradstreet Twp



Google Earth photo overlay image illustrating a view looking northeast from Moore Pond. Structures 684 - 688, evaluated at 130 feet, are shown as red lines. Intervening shoreline vegetation and topography would block views of the structures.





# PRIORITY AREAS FOR HABITAT CONNECTIVITY

## TNC Area 6: Context Aerial Image



Tapered vegetation would be preferred in TNC Area 6 over taller structures to minimize potential adverse effects on the view from Coburn Mountain, from which the Project is currently minimally visible. Taller structures would elevate the conductors above the treeline where they would be more noticeable.

The use of tapered vegetation, already proposed by CMP in the Rusty Blackbird habitat adjacent to Spencer Road, will minimize visual effects to recreational users.

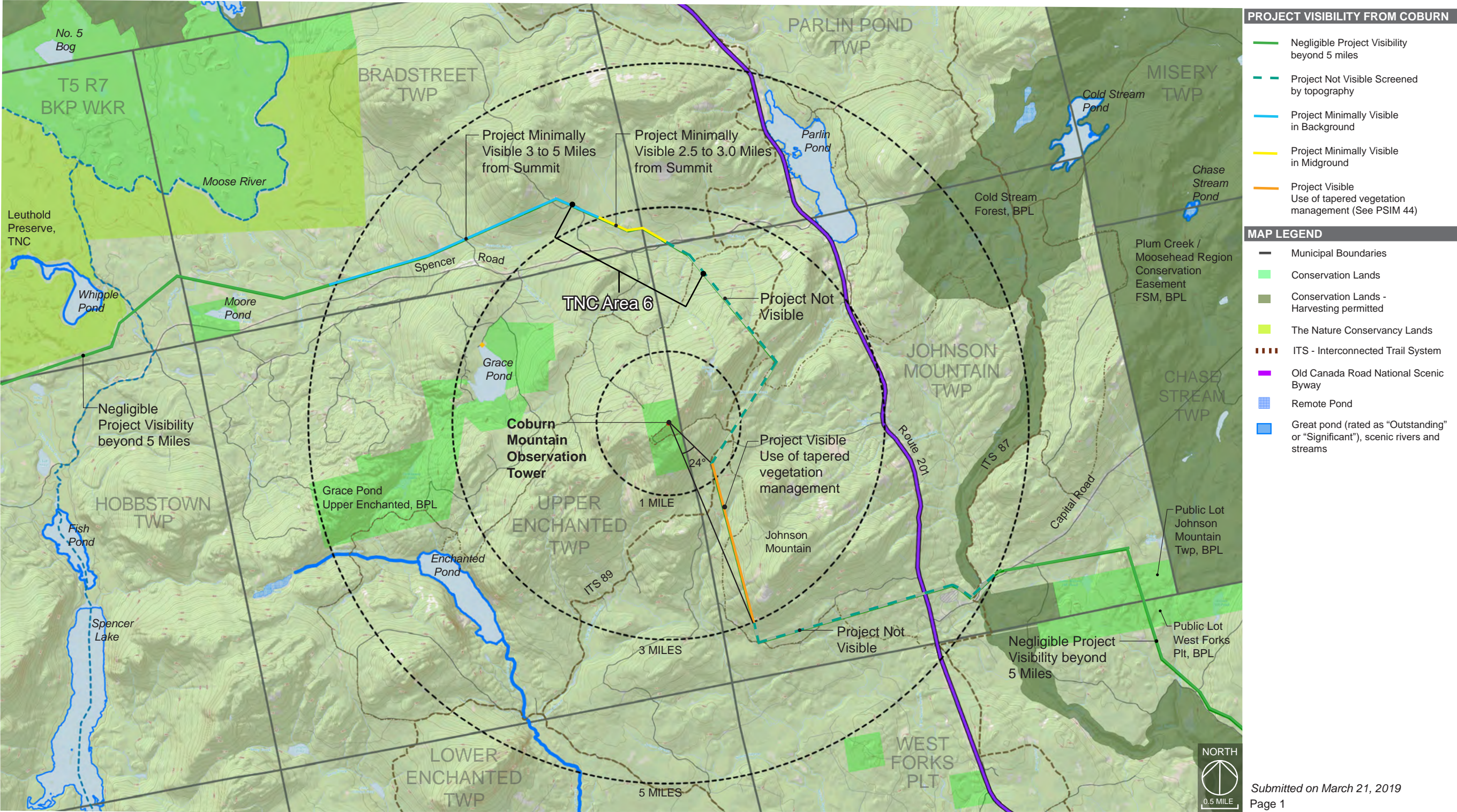




PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Area 6

Rebuttal Testimony from Amy Segal  
Exhibit CMP - 5.1 - A: Project Visibility from Coburn Mountain



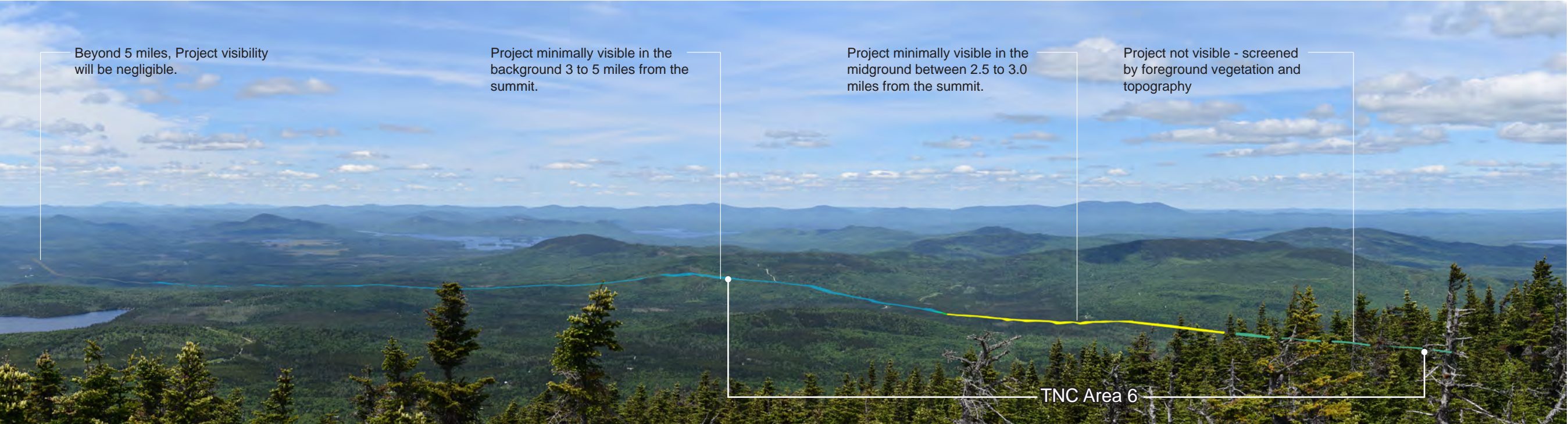
The TNC Area 6 has been added to this illustration of Project visibility from Coburn Mountain. See photographs on page 21.



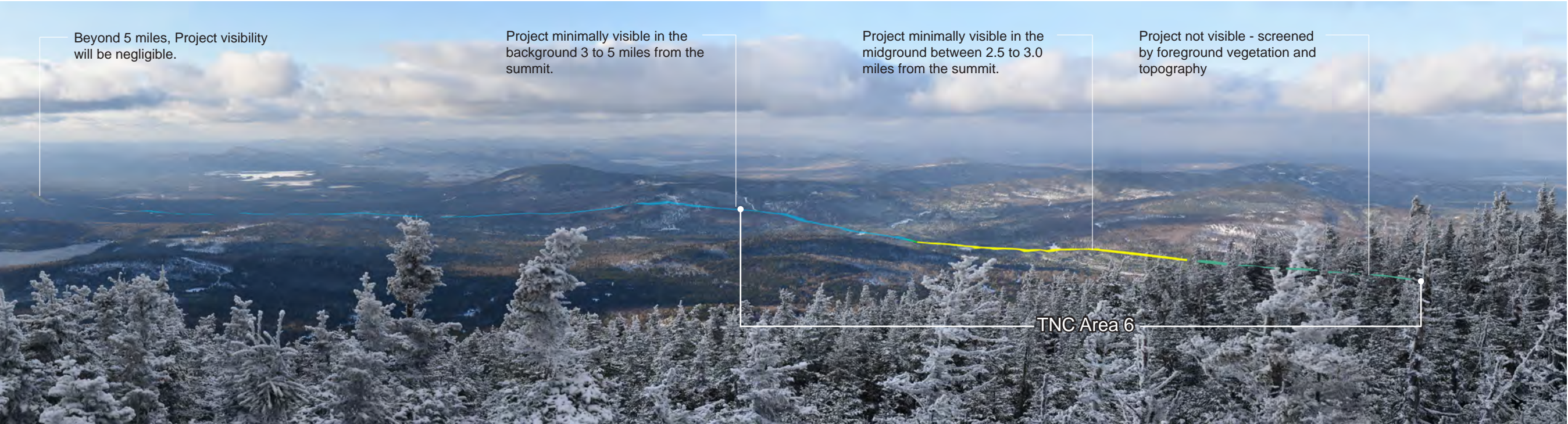
PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Area 6

Rebuttal Testimony from Amy Segal  
Exhibit CMP - 5.1 - A: Project Visibility from Coburn Mountain



Leaf-on: View looking west to north from observation tower at the summit of Coburn Mountain.



Leaf-off: View looking west to north from observation tower at the summit of Coburn Mountain.

Submitted on March 21, 2019  
Page 4

The TNC Area 6 has been added to these photographs from Coburn Mountain.



# PRIORITY AREAS FOR HABITAT CONNECTIVITY

## TNC Area 7: Context Aerial Image



TNC Area 7 would not be visible from the summit of Coburn Mountain due to intervening vegetation and topography.





PRIORITY AREAS FOR HABITAT CONNECTIVITY

TNC Area 7: Parlin Pond, Parlin Pond Twp



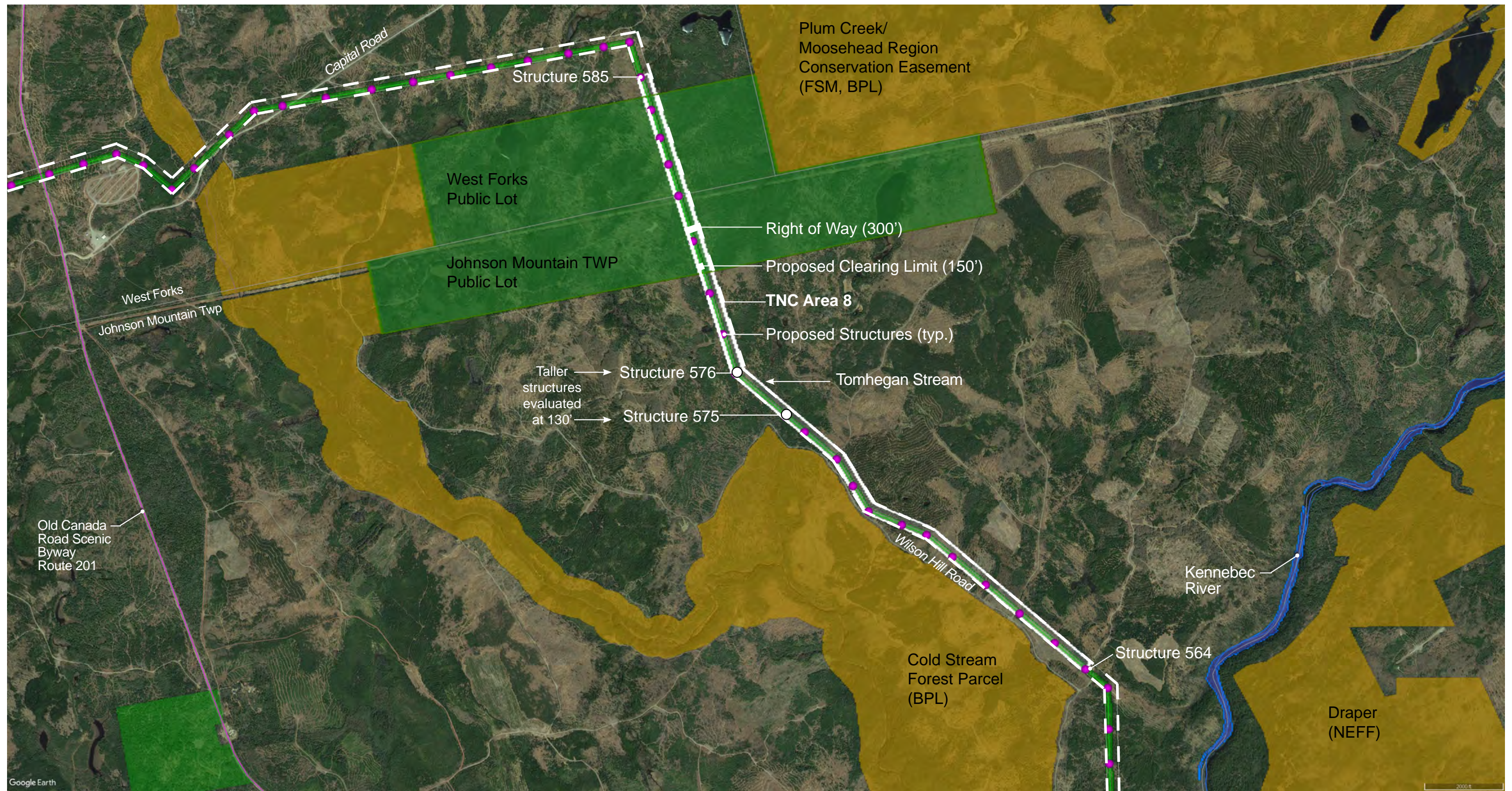
Previously submitted photosimulation:  
Panoramic view looking south to southwest from the northern end of Parlin Pond in Parlin Pond Twp toward the proposed HVDC transmission line. Five proposed HVDC structures, conductors and portions of the corridor clearing will be visible crossing the east shoulder of Coburn Mountain within 3 miles of this viewpoint. Portions of the cleared corridor will be slightly more visible in leaf-off conditions. The weathered steel HVDC structures will generally blend in with the wooded hillside. The conductors will be most visible in early morning light. Non-specular conductors will be used to minimize glare.

The use of taller structures in TNC Area 7 may result in greater Project visibility from Parlin Pond and Route 201 (Old Canada Road Scenic Byway). Tapered vegetation would be preferable.



# PRIORITY AREAS FOR HABITAT CONNECTIVITY

## TNC Area 8: Context Aerial Image



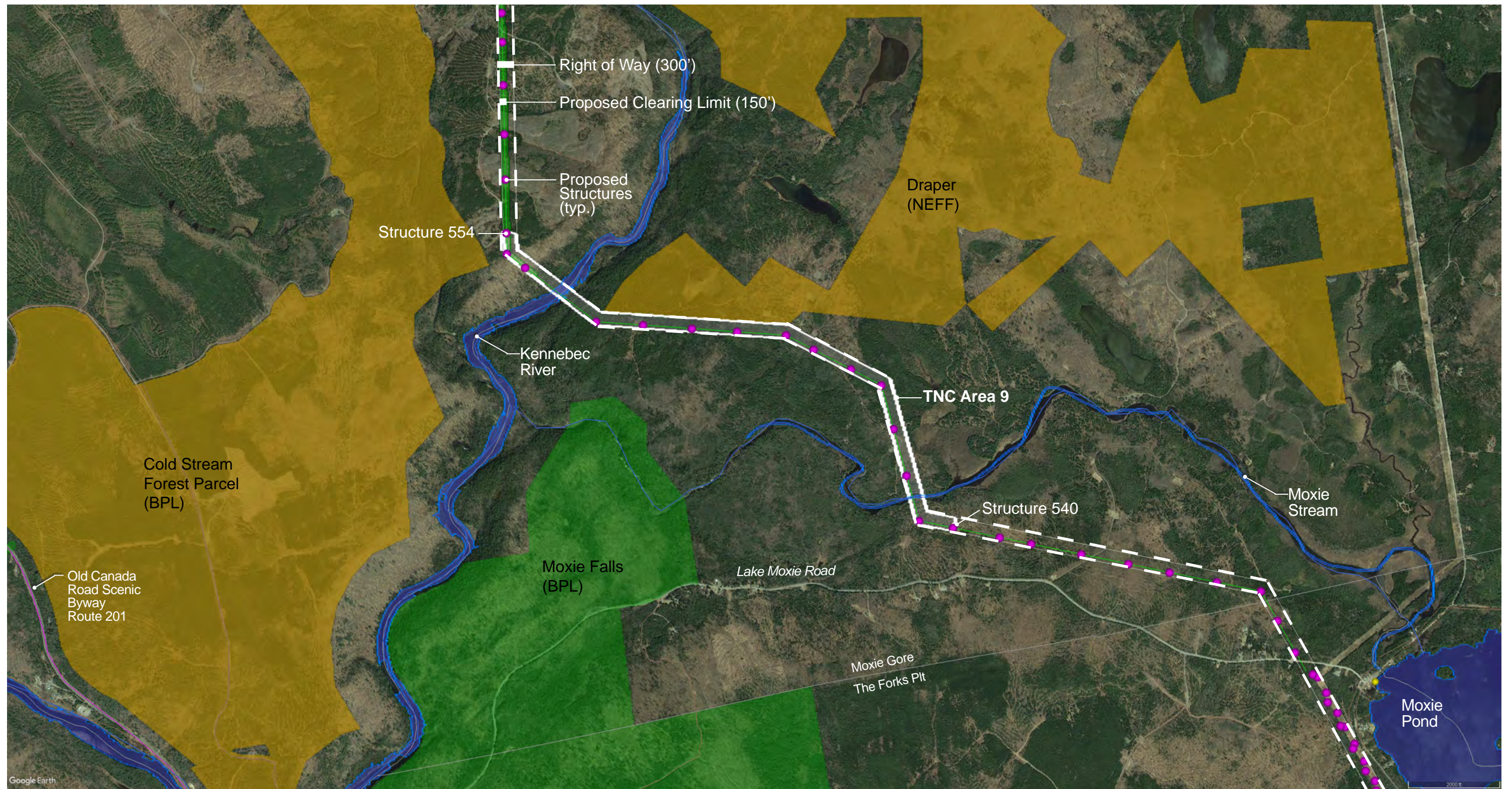
Taller structures on either side of Tomhegan Stream would preserve taller vegetation adjacent to the stream and elevate the conductors a greater distance above the stream. The taller structures would not be visible from the stream due to preserved vegetation.

Tapering would minimize visual effects to recreational users on Wilson Hill Road where the Project corridor is near the road. Taller structures would be more visible to recreational users of the road due to the presence of commercial forestry operations on the northeast side of the road.



# PRIORITY AREAS FOR HABITAT CONNECTIVITY

## TNC Area 9: Context Aerial Image



CMP, working with Maine IF&W, has already proposed tapering in specific locations within the Upper Kennebec deer wintering area portion of TNC Area 9. Riparian buffers are proposed adjacent to Moxie Stream. The forestland on either side of the Kennebec River will be preserved through the use of Horizontal Directional Drill (HDD) technology.



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED SUPPLEMENTAL TESTIMONY OF  
KENNETH FREYE

May 1, 2019

This testimony is in response to the questions and data requests in the Tenth Procedural Order.

**I. APPENDIX A TO THE TENTH PROCEDURAL ORDER**

Appendix A to the Tenth Procedural order included questions and data requests on specific topics. In this supplemental testimony, I respond to the questions stated below.

**QUESTION 25, EXPLANATION OF HOW THE CONNECTION POINT WAS CHOSEN ON THE QUEBEC/MAINE BORDER, AND WHETHER THIS WAS DECIDED BY HYDRO-QUEBEC OR REAL ESTATE CONSTRAINTS. WHETHER THERE IS FLEXIBILITY IN THIS LOCATION OR IF THERE ARE OTHER TIE-IN POINTS ON THE QUEBEC BORDER.**

The process of siting and acquiring a corridor for an overhead electric transmission line between the Canadian border and CMP's existing transmission line system began in January 2014, and the siting and acquisition was substantially completed by late 2017. While a connection with Hydro-Québec was desired, the project concept included the possibility of Maine wind generation and/or Canadian wind generation. Hydro-Québec was committed to the Northern Pass project at that time and did not participate in discussions regarding a specific border crossing location.

The initial target for a border crossing location was an unspecified point in Gorham Gore Township (T1R9 WBKP). However, a crossing in Gorham Gore was quickly eliminated because any practical route to Gorham Gore would pass through the Holeb Maine Public Reserved Lands and lands of The Nature Conservancy, and would bisect lands of the Passamaquoddy Tribe. A border crossing somewhere in Beattie Township or the northern part of Merrill Strip Township appeared feasible based on topography, land ownership, and lack of known environmental constraints.

Any connection with the Hydro-Quebec system would need to originate from one of two substations located west of the Maine-Quebec border, one near Thetford Mines and one near Sherbrooke; there are no connection points closer to the Maine-Quebec border. The Hydro-Québec infrastructure between the Appalaches Substation near Thetford Mines and the border was examined, as well as the ownership on the Québec side of the border in the Merrill Strip-

Beattie area. Hydro-Quebec has a transmission line corridor between Thetford Mines and Lac-Megantic, the land on the Quebec side of the border abutting the crossing point is industrial forest land, and, based on our examination of aerial imagery, an expansion of the existing Hydro-Quebec transmission line and connection to the crossing point appeared feasible.

The actual border crossing point was selected because it has good access from existing logging roads. Conversely, the elevation along the Maine-Quebec border increases to the south, reaching 2,700 feet within  $\frac{3}{4}$  mile of the crossing point, and moving the crossing point farther north would increase the length of the corridor across Beattie Township. Increasing the length of the corridor would increase the amount of clearing and the potential resource impacts, with no benefit. Thus, the corridor was sited and acquired with the border crossing at the current location in Beattie Township. Hydro-Québec sited its connection location after the NECEC corridor was acquired.

Any change in the border crossing location now would require the acquisition of a new corridor by both CMP and Hydro-Québec, new natural and cultural resource and cadastral surveys, and preparation and submission of amended permit applications. The acquisition and survey process likely would take three to four years.

In summary, the proposed Québec/Maine border transmission line crossing location was determined based on real estate constraints and other feasibility considerations, including topographic, social, and preserved/protected land locations. The contractual timeline and obligations for completion and in-service date of the NECEC Project do not allow reconsideration and evaluation of alternate transmission line crossing locations at this time.

Also, there are no other existing transmission line crossings on the Québec/Maine border that could allow co-location of a new transmission line border crossing.

**QUESTION 26, WHETHER AN UNDERGROUND ROUTE CO-LOCATED WITH ROUTE 201 WOULD BE TECHNICALLY FEASIBLE, ECONOMICALLY VIABLE, AND/OR A SATISFACTORY OPTION TO MITIGATE CONCERNS RAISED DURING THE HEARING.**

There are multiple aspects to this question to be considered. For example, what portions of the Project would be co-located with Route 201: Moscow to Quebec, Johnson Mountain to Quebec, or something less? What would co-location entail: entirely within the highway limits, acquisition of additional adjacent land, or crossings under the travel lanes? What other constraints would be involved: time frame to complete, use of eminent domain, or going around or through The Forks/West Forks, Jackman/Moose River?

Responses to these considerations, based on a very high level review not comparable to the thorough study that was conducted to select the proposed route (the NECEC corridor took nearly three years to site), are as follows:

- There is insufficient space within the highway limits to construct and bury an underground electric transmission line and appurtenant facilities. Although the highway is 132 feet wide in some areas, approximately 90 feet is cleared for the paved surface, shoulders, ditches, grading and utilities. This leaves 42 feet, assumed to be split generally between the east and west sides of the highway. Given that the centerline of the buried cable needs to be approximately 35 feet from the tree line, an underground transmission line would not fit within the highway limits. This does not account for additional grading that would be needed in many locations to provide a surface on which construction equipment could operate or space to excavate and install splice boxes.
- Acquiring land outside the highway limits for any distance with any consistency would be extremely difficult. Residential, recreational, and small commercial landowners likely would object to having a large trench dug across the road front of their property, losing access during construction and having permanent restrictions placed on the front of their properties.

- It would not be possible to stay within the highway limits through village areas. Acquiring new corridor around the village areas is not reasonably feasible due to physical and social constraints.
- It would not be safe or practical to construct an underground electric transmission line on the same side of the highway as the existing overhead distribution lines. The boomed equipment used to trench, move cable rolls, and place splice boxes are all capable of contacting overhead distribution lines and any underbuilt utilities. Guy cables and anchors are susceptible to contact with construction equipment; contacts can cause outages and/or damage to structures. Roadside distribution lines typically are located on the outside of curves to facilitate guying and therefore switch from one side of the highway to the other as the direction of the curve changes. Unless the underground transmission were located entirely outside of the highway limits, the underground line would need to move from one side of the highway to the other to remain on the opposite side from the overhead distribution line; how the underground transmission line crosses the roadway would need to be resolved with MDOT.

This brief summary does not address the environmental impacts to wetlands and streams, visual impacts, or impacts on traffic, which are likely to be significant but have not been thoroughly studied for this alternative. Additional considerations on the constructability along Route 201 are included in Justin Bardwell's supplemental testimony.

In sum, an underground route co-located with Route 201 would not be technically feasible, economically viable, and/or a satisfactory or practicable option to mitigate concerns raised during the hearing.

## **II. APPENDIX B TO THE 10<sup>TH</sup> PROCEDURAL ORDER**

**ITEM 2, THE APPLICATION STATED THAT PLUM CREEK MAINE TIMBERLANDS LLC "SPECIFICALLY DID NOT WANT A TRANSMISSION LINE LOCATED ALONG THE SPENCER ROAD." PLEASE PROVIDE EVIDENCE FROM THE LANDOWNER TO THAT EFFECT.**

In the initial meetings (early 2014 to early 2015) with Plum Creek Maine Timberlands, LLC (PCT), the then-owner of much of the land on which the new NECEC corridor was subsequently located and the owner of most of the land along the Spencer Road, PCT and CMP




discussed the general location of the corridor and potential adverse impacts to PCT's forest operations. Because locating the NECEC corridor along the Spencer Road could adversely impact PCT's ability to relocate the road from time to time, replace culverts and bridges, construct and maintain ditches and tail ditches, use existing log landing areas and gravel pits, construct new log landing areas and gravel pits, and generally impede access to its abutting land, CMP agreed to generally locate the corridor away from the Spencer Road. From CMP's perspective, this was reasonable and the NECEC corridor was sited accordingly. These were verbal discussions without any documentation. PCT subsequently sold all of its holdings to Weyerhaeuser Company after CMP had secured the rights to the corridor and access roads.

From the perspective of the person responsible for siting the NECEC corridor, siting an overhead transmission line adjacent to a road is generally a poor idea unless the road is straight and the surrounding country flat and dry. Roads curve, while overhead transmission lines are a series of straight tangents. If the transmission line adheres to the location of the road, many angle structures are needed, some of which may need to be located in wetlands, other sensitive areas, or low points creating sub-optimal span lengths and unnecessary impacts. If the transmission line only generally follows the course of the road, as the generator lead does along the Golden Road where it parallels the Penobscot River, small islands or strips of timberland are created between the road and transmission line.

For all of these reasons, it would not have been practicable to co-locate the NECEC Project adjacent to the Spencer Road.

Dated: April 25, 2019

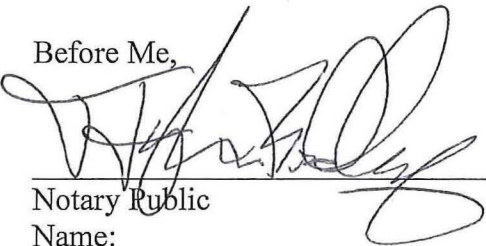
Respectfully submitted,

  
Kenneth H. Freye

STATE OF MAINE  
Kennebec, ss.

The above-named Kenneth H. Freye did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

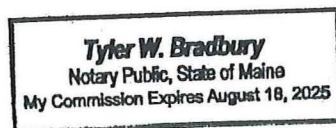
Before Me,

  
Notary Public

Dated: April 25, 2019

Name:

My Commission Expires:



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

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Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED SUPPLEMENTAL TESTIMONY OF  
JUSTIN TRIBBET

May 1, 2019

This testimony is in response to the questions and data requests in the Tenth Procedural  
Order.

## **I. APPENDIX A TO THE TENTH PROCEDURAL ORDER**

### **QUESTION 11, IDENTIFY ENGINEERING STANDARDS, SAFETY OR DESIGN CODES, ETC. THAT SPECIFICALLY APPLY TO THIS PROJECT.**

For the NECEC Project the HVDC overhead transmission line will comply with all required transmission line codes and standards and numerous elective standards. I provide below a list of applicable standards identified by the NECEC transmission line design team to date:

1. Avangrid TM2.23.00 – Overhead Transmission Construction Standards
2. ACI 318, Building Code Requirements for Structural Concrete
3. ANSI C2: National Electric Safety Code (NESC)
4. ASCE 48: Design of Steel Transmission Pole Structures
5. ASCE 72: Design of Steel Transmission Pole Structures
6. ASCE 74: Guidelines for Electrical Transmission Line Structural Loading
7. ASCE 91: Design of Guyed Electrical Transmission Structures
8. CIGRE Overhead Lines
9. CIGRE 63: Guide to Procedures for Estimating the Lightning Performance of Transmission Lines
10. CIGRE 273: Overhead Conductor Safe Design Tension with Respect to Aeolian Vibrations
11. CIGRE 322: State of the Art of Conductor Galloping
12. CIGRE 348: Tower Top Geometry and Mid Span Clearances
13. CIGRE 518: Outdoor Insulation in Polluted Conditions - Guide to Selection and Dimensioning-Part 2: DC Case
14. EPRI Red Book: Transmission Line Reference Book, 200 kV and Above, 3rd Edition
15. EPRI Orange Book: Transmission Line Reference Book, Wind Induced Conductor Motion
16. EPRI HVDC Transmission Reference Book – The Olive Book
17. FHWA-NHI-10: Drilled Shafts: Construction Procedures and LRFD Design Methods
18. IEC 60060-1: High Voltage Test Technique
19. IEC 60071-2: Insulation Co-ordination – Part 2: Application Guide
20. IEC 60120: Dimensions of Ball and Socket Couplings of String Insulator Units
21. IEC 60383-2: Ceramic or Glass Insulators Units for DC Systems - Part 2
22. IEC 60437: Radio Interference Test on High-Voltage Insulators

23. IEC 60815-4: Selection and Dimensioning of HV Insulators for DC Systems
24. IEC 60826: Design Criteria of Overhead Lines
25. IEC 61245: Artificial Pollution Tests on High-Voltage Insulators for DC Systems
26. IEC 61325: Ceramic or Glass Insulators Units for DC Systems
27. IEEE C95.6: Standard for Safety Levels with Respect to Human Exposure to Electromagnetic Fields, 0-3 kHz
28. IEEE 4: Standard for High-Voltage Testing Techniques
29. IEEE 516: Guide for Maintenance Methods on Energized Power Lines
30. IEEE 524: Guide to the Installation of Overhead Transmission Line Conductors
31. IEEE 524a: Guide to Grounding during the Installation of Overhead Transmission Line Conductor: Supplement to IEE Std. 524-1992
32. IEEE 539: Standard Definitions of Terms Relating to Corona and Field Effects of Overhead Power Lines
33. IEEE 656: Standard for the Measurement of Audible Noise from Overhead Transmission Lines
34. IEEE 691: Guide for Transmission Structure Foundation Design and Testing.
35. IEEE 738: Standard for Calculating the Current-Temperature Relationship of Bare Overhead Conductors
36. IEEE 951: Guide to the Assembly and Erection of Metal Transmission Structures
37. IEEE 977: Guide to Installation of Foundations for Transmission Line Structures
38. IEEE 1138: Standard for Testing and Performance for Optical Ground Wire (OPGW) for Use on Electric Utility Power Lines
39. IEEE 1313.2: Guide for the Application of Insulation Coordination
40. IEEE 1243: Guide for Improving the Lightning Performance of Transmission Lines
41. IEEE 1591.1: Standard for Testing and Performance of Hardware for Optical Ground Wire (OPGW)
42. IEEE PES Overhead Lines Subcommittee TR62: "Guide for High Voltage Direct Current Overhead Transmission Line Design"
43. NESC: National Electrical Safety Code, 2017
44. USDA: RUS 1724E-200: Design Manual for High Voltage Transmission Lines

For a detailed list of underground HVDC transmission standards please refer to Justin Bardwell's testimony.



**QUESTION 18, A DESCRIPTION OF THE DIFFERENCES OF NORMAL OPERATION AND MAINTENANCE (O&M) COSTS BETWEEN OVERHEAD AND UNDERGROUND LINES.**

The yearly cost of normal operations and maintenance of an overhead transmission line compared to an underground cross-linked polyethylene (XLPE) transmission line can be approximated as follows:

- Overhead Transmission Line: 1.5-2%<sup>1</sup> of capital costs
- Underground XLPE Transmission Line: 0.2-0.4%<sup>1</sup> of capital costs

Based on these estimates and considering the underground alternatives originally explored in Mr. Bardwell's rebuttal testimony, the yearly maintenance costs of the proposed NECEC HVDC line could be approximated in the table below (values in millions of USD).

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<sup>1</sup> See Page 12, Table VII of: "Comparative Analysis of Cost between EHV AC Overhead Transmission Lines and Underground Transmission XLPE Cables" by Preet Khandelwal, Arun Pachori. International Journal of Enhanced Research in Science Technology & Engineering, ISSN: 2319-7463 Vol. 2 Issue 6, June-2013, pp: (7-14), Available online at:  
[https://www.academia.edu/3893194/Comparative\\_Analysis\\_of\\_Cost\\_between\\_EHV\\_AC\\_Overhead\\_Transmission\\_Lines\\_and\\_Underground\\_Transmission\\_XLPE\\_Cables](https://www.academia.edu/3893194/Comparative_Analysis_of_Cost_between_EHV_AC_Overhead_Transmission_Lines_and_Underground_Transmission_XLPE_Cables)

| <b>Alternative Option</b>                                                   | <b>Overhead-<br/>(Baseline)</b> | <b>Underground-<br/>Proposed Route<br/>(Alternative)</b> | <b>Underground-<br/>Alternative Route<br/>(Alternative)</b> | <b>Underground-New<br/>53.5-mile Corridor<br/>Proposed Route<br/>(Alternative)</b> |
|-----------------------------------------------------------------------------|---------------------------------|----------------------------------------------------------|-------------------------------------------------------------|------------------------------------------------------------------------------------|
| NECEC Overhead HVDC Line Capital Costs                                      | 260 <sup>2</sup>                | 0                                                        | 0                                                           | 160 <sup>3</sup>                                                                   |
| NECEC Alternative HVDC Underground Line Capital Costs                       | 33                              | 1,878 <sup>4</sup>                                       | 2,067 <sup>5</sup>                                          | 750 <sup>6</sup>                                                                   |
| Yearly Operations and Maintenance Costs Overhead <sup>7</sup>               | 4.6                             | 0                                                        | 0                                                           | 2.8                                                                                |
| Yearly Operations and Maintenance Costs Underground <sup>8</sup>            | 0.1                             | 5.6                                                      | 6.2                                                         | 2.3                                                                                |
| <b>Yearly HVDC Line Operations and Maintenance Costs- Total<sup>9</sup></b> | <b>4.7</b>                      | <b>5.6</b>                                               | <b>6.2</b>                                                  | <b>5.1</b>                                                                         |

Based on the data in the table above, the yearly operations and maintenance costs associated with the alternatives involving underground would be between 9% and 32% higher than the overhead NECEC Project baseline.

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<sup>2</sup> From Tribbet Rebuttal Testimony, table on Page 5: Existing Project Cost [Overhead- (Baseline)] - Existing Project Cost [Underground-Proposed Route (Alternative)]

<sup>3</sup> From Tribbet Rebuttal Testimony, table on Page 5: Existing Project Cost [Underground-New 53.5-mile Corridor Proposed Route (Alternative)]- Existing Project Cost [Underground-Proposed Route (Alternative)]

<sup>4</sup> See rebuttal testimony of Justin Bardwell, Exhibit CMP-11-B.

<sup>5</sup> See rebuttal testimony of Justin Bardwell, Exhibit CMP-11-D.

<sup>6</sup> See rebuttal testimony of Justin Bardwell, Exhibit CMP-11-C.

<sup>7</sup> Assumed average of 1.5-2% range or 1.75% of capital costs.

<sup>8</sup> Assumed average of 0.2-0.4% range or 0.3% of capital costs.

<sup>9</sup> Total of yearly overhead and underground HVDC line operations and maintenance costs for each alternative.

Furthermore, as previously noted in the testimony of Justin Bardwell, repairing cable failures would be much more expensive and could jeopardize CMP's ability to meet the Project purpose, including the required 90% monthly availability.

**QUESTION 23, WHAT THE DIFFERENCE IS BETWEEN CONCEPTUAL LEVEL ESTIMATES AND PRELIMINARY ESTIMATES, AND HOW FINAL CONSTRUCTION-LEVEL COST ESTIMATES COMPARE TO CONCEPTUAL LEVEL COST ESTIMATES**

In Mr. Bardwell's rebuttal testimony, he characterizes his estimates as "conceptual level" and "preliminary." These characterizations were not intended to imply a difference in estimate type or class, but rather to clarify that detailed engineering work has not been completed.

CMP utilizes the estimating procedures and practices detailed by ISO-NE Planning Procedure 4, Attachment D. This procedure specifies, in Table 1 below, the differences in each estimate type regarding the level of project definition, estimate class and type, and assumed accuracy levels of a given estimate type.

| Project Stage        | Level of Project Definition | Estimate Class | Estimate Type         | Regional Review                       | RSP Listing Target Accuracy |
|----------------------|-----------------------------|----------------|-----------------------|---------------------------------------|-----------------------------|
| Project Initiation   | 0% to 15%                   | -              | Order of Magnitude    | Need Approval (RSP Listing)           | -50% to +200%               |
| Proposed Project     | 15% to 40%                  | A              | Conceptual Estimate   | CRC Review / Retain Proposed Solution | -25% to +50%                |
| Planned Project      | 40% to 70%                  | B              | Planning Estimate     | PPA Approval                          | -25% to +25%                |
| Final Project Design | 70% to 90%                  | C              | Engineering Estimate  | CRC Review / TCA Approval             | -10% to +10%                |
| Under Construction   | 80% to 100%                 | D              | Construction Estimate |                                       | -10% to +10%                |

**Table 1:** Cost Estimate types per project phase (From AACE definition & customized for Transmission Project)

Based on the estimate type definitions above, Mr. Bardwell's estimates are Estimate Class A- Conceptual Estimates; Mr. Bardwell uses the words "conceptual" and "preliminary" interchangeably. The term "Final Construction-Level" estimate, used in the question above, is

equivalent to an Estimate Class D- Construction Estimate, in accordance with ISO-NE Planning Procedure 4 Attachment D Table 1.

To explain further the differences between an Estimate Class A- Conceptual Estimate and an Estimate Class D- Construction Estimate, I provide below Table 2, from ISO-NE Planning Procedure 4, Attachment D. This table provides a suggested contingency range from EPRI to be considered as a function of estimate class.

| Estimate Class | Descriptive (AACE / EPRI)                               | From AACE                                                            |                                                                     | From EPRI             |
|----------------|---------------------------------------------------------|----------------------------------------------------------------------|---------------------------------------------------------------------|-----------------------|
|                |                                                         | LEVEL OF PROJECT DEFINITION<br>Expressed as % of complete definition | EXPECTED ACCURACY RANGE<br>Typical variation in low and high ranges | Suggested Contingency |
| A              | Study / Simplified Estimate                             | 1% to 15%                                                            | L: -15% to -60%<br>H: +30% to +120%                                 | 30-50 %               |
| B              | Budget, Authorization or Control / Preliminary Estimate | 10% to 40%                                                           | L: -10% to -30%<br>H: +20% to +60%                                  | 15-30%                |
| C              | Control or Bid / Detailed Estimate                      | 30% to 70%                                                           | L: -5% to -15%<br>H: +10% to +30%                                   | 10-20%                |
| D              | Check Estimate or Bid / Finalized Estimated             | 50% to 100%                                                          | L: -5% to -5%<br>H: +10% to +10%                                    | 5-10%                 |

**Table 2:** Cost Estimate types and relevance based on level of project definition

Based on these tables, we can make the following general comparisons between an Estimate Class A- Conceptual Estimate and an Estimate Class D- Construction Estimate:

- An Estimate Class D- Construction Estimate requires a higher level of project definition (i.e., percent complete of engineering) to produce than an Estimate Class A- Conceptual Estimate, as shown in Table 1, 80% to 100% vs. 15% to 40%.
- An Estimate Class D- Construction Estimate has a higher level of target accuracy than an Estimate Class A- Conceptual Estimate, as shown in Table 1, -10% to +10% vs. -25% to +50%.

- An Estimate Class D- Construction Estimate typically has a lower level of suggested contingency than an Estimate Class A- Conceptual Estimate as shown in Table 2, 5% to 10% vs. 30% to 50%.

Note that in the case of the estimates prepared by Mr. Bardwell in Exhibit CMP-11-B, CMP-11-C, CMP-11-D, and CMP-11-F, he elected to reduce contingency levels below the EPRI recommended ranges above to make the estimates more comparable to the assumptions in the NECEC project selected bid in the 83D RFP.

## **II. APPENDIX B TO THE TENTH PROCEDURAL ORDER**

### **ITEM 4, FOR ALL THE COST ESTIMATE SUMMARY SHEETS IN THE REBUTTAL TESTIMONY, PLEASE PROVIDE ADDITIONAL BACKUP SPREADSHEETS OR DETAILS FOR HOW EACH OF THE LINE ITEM COSTS WERE DETERMINED.**

Referring to my rebuttal testimony, the table on page 5 includes a tabulation that presents the incremental total project cost for the three proposed underground alternatives: Underground-Proposed Route, Underground-Alternative Route, and Underground-New 53.5-mile Corridor Proposed Route. It also includes a column labeled Overhead (Baseline), which is included as a reference to the NECEC Project baseline costs. I provide details below to explain how each of the line item costs of that table were determined.

**Existing Project Costs** - This row contains all the Project costs that are not related to the underground alternative analysis. To derive the number, I started with the Project total cost of \$0.95 billion and subtracted the corresponding length of the overhead transmission line that would be removed under this alternative. Specifically for the Underground- Proposed Route and



the Underground- Alternative Route alternatives, the total cost of the 145.3 mile overhead HVDC transmission line was removed, so the calculation was as follows: \$0.95B (project total) - \$0.26B (145.3-mile removed overhead line) = \$0.69B. For the Underground- New 53.5-mile Corridor Proposed Route the same approach was utilized, but only the costs of overhead line along the new corridor route were removed. In that scenario the corresponding calculation would be: \$0.95B (project total) - \$0.10B (overhead line removed in 53.5-mile new corridor segment) = \$0.85B.

**Alternative Underground Cost** - This row contains the underground costs associated with each of the three alternatives, and this cost is taken directly from the Rebuttal Testimony of Justin Bardwell. Specifically, for each alternative: (1) Underground-Proposed Route, see Exhibit CMP-11-B, (2) Underground-Alternative Route, see Exhibit CMP-11-D, and (3) Underground-New 53.5-mile Corridor Proposed Route, see Exhibit CMP-11-C.

**Overhead Mitigation Value Removed** - This row contains a negative number equal to the incremental costs of the agreed-upon overhead line mitigation measures. The intent of this row is to ensure that we remove these costs because they are not required for the underground alternative. This is consistent between all underground alternatives, because the mitigation measures are in the new 53.5-mile corridor section. The description of the mitigation measures and the corresponding \$11 million cost was provided on page 4 of my rebuttal testimony.

**Total** - This row contains the summation of the rows noted above and represents the total project cost for each alternative.

**Incremental Project Costs** - This row contains the incremental costs of each project alternative. To derive this number the following equation was used for each alternative: Total

(Respective Underground Alternative) – \$0.95B = Incremental Project Costs (Respective Underground Alternative).

**Incremental Project Costs (%)** - This row contains the incremental costs of each project alternative expressed as a percent. To derive this number the following equation was used for each alternative:  $[\text{Total (Respective Underground Alternative)} - \$0.95\text{B}] / \$0.95\text{B} = \text{Incremental Project Costs \% (Respective Underground Alternative)}$ .

Dated: April 25, 2019

Respectfully submitted,

  
Justin Tribbet

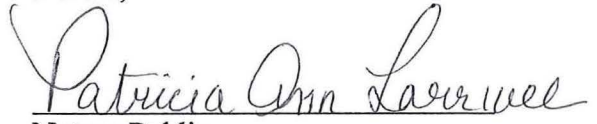
STATE OF MAINE

Kennebec, ss.

The above-named Justin Tribbet did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Dated: April 25, 2019

Before,

  
Notary Public  
Name: PATRICIA ANN LARRIVÉE  
My Commission Expires: 4/7/2026

STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED SUPPLEMENTAL TESTIMONY AND EXHIBITS OF  
JUSTIN BARDWELL

May 1, 2019

This testimony is in response to the questions and data requests in the Tenth Procedural Order.

**I. APPENDIX A TO THE TENTH PROCEDURAL ORDER**

**QUESTION 3, A MORE DETAILED DESCRIPTION OF UNDERGROUNDING TECHNIQUES INCLUDING DIRECT BURIAL, DUCT BANK INSTALLATION, OR TRENCHLESS INSTALLATION. THIS SHOULD ALSO INCLUDE TYPICAL DIMENSIONS, MATERIALS AND CROSS-SECTION DIAGRAMS.**

My rebuttal testimony<sup>1</sup> describes the basic installation steps for the underground construction methods. Many of the details of the installation methods are driven by limitations on the amount of cable that can be transported and installed as a single length. For this project standard road transportable reels will hold approximately 2,500 feet of cable at most. Longer lengths are possible but would require oversize and overweight loads. The National Electrical Safety Code (NESC) requires a minimum cover (depth to surface) of 42 inches over the cable. It is common in cold weather climates to increase the burial depth to limit disruption due to freeze/thaw cycles. In the Project area a minimum cover of 60 inches is recommended.

See Exhibit CMP-11.1-A for typical sections identifying dimensions and materials for direct buried installation, duct bank installation, precast concrete joint bays (splicing vaults), horizontal directional drills, and microtunneling installations. See Exhibit CMP-11.1-B for pictures of similar installations.

**QUESTION 4, A DESCRIPTION OF THE DIFFERENCES OF NORMAL OPERATION AND MAINTENANCE (O&M) ACTIVITIES BETWEEN OVERHEAD AND UNDERGROUND LINES.**

Normal maintenance activities for overhead lines consist of visual inspections of the conductors, splices, insulators, poles, and vegetation along the route by helicopter twice a year, and visual inspection by foot once a year. In addition, every four to five years a more detailed inspection is conducted, including infrared scanning for conductor condition, and a condition evaluation of the poles. The access to any specific section of the line for these operations normally can be achieved through temporary access with provisional matting.

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<sup>1</sup> Pre-Filed Rebuttal Testimony and Exhibits of Justin Bardwell (CMP-11).



Normal maintenance for underground lines depends on the type of installation. For lines installed in duct bank, visual inspection of the terminations, joints, and cable racking systems are required. This requires entering the pre-casting jointing bays roughly twice a year. For direct buried cable systems maintenance is similar, but the joints are inaccessible, so most utilities will partially expose the joints for inspection every 5 years. In both cases the utility must patrol the route, ensuring that access to the jointing locations is maintained, vegetation is managed, and no unauthorized dumping or construction has occurred over the cable route.

For transmission lines with a high availability requirement such as the NECEC, it is also common to conduct diagnostic testing on a 5-year schedule. This testing requires access to every joint and termination of any underground section. The testing includes electrically testing the cable jacket to identify breaks that could lead to corrosion and partial discharge monitoring, to identify developing deficiencies in the cable insulation body.

The requirement of having access to every joint and termination of an underground section through its operating life requires having permanent access roads to most of the joint locations, as described in my rebuttal testimony. Additionally, the maintenance of these access roads will mean additional costs not incurred by an overhead line.

Vegetation management will be similar for overhead and underground lines, with a vegetation maintenance cycle typically every four years and an annual inspection to identify areas of concern that may require remediation prior to the normal maintenance cycle.

**QUESTION 5, WHETHER FEWER LONGER SECTIONS (VERSUS MORE SHORTER SECTIONS) OF THE LINE COULD BE UNDERGROUNDED THAT WOULD MINIMIZE BOTH THE NUMBER OF TRANSITION STATIONS AS WELL AS THE ENVIRONMENTAL IMPACT OF THE PROJECT.**

Extending the length of the underground segment is not a reasonable alternative because, as explained in my rebuttal testimony, underground transmission has significantly higher temporary environmental impacts and limited reductions in permanent environmental impacts when compared to overhead transmission, along with increased operational risk that could compromise the Project's ability to meet its availability requirements, and greatly increased cost. Although a fewer number of longer underground sections would have fewer termination stations than a larger number of shorter underground sections, neither alternative is practicable or less environmentally damaging than the proposed overhead line.

**QUESTION 6, EXPLANATION OF WHY A PERMANENT ROAD WOULD NEED TO BE CONSTRUCTED TO EACH SPLICE LOCATION (UNDERGROUNDING), BUT NOT FOR OVERHEAD POLES. EXPLANATION OF WHY MATTING ALONG THE ROW (WHICH COULD BE USED FOR OVERHEAD POLES) COULD NOT BE USED FOR SPLICE BOXES.**

Splicing vaults for +/-320kV HVDC joints weigh approximately 75,000 pounds and are shipped in three sections of between 25,000 and 40,000 pounds each. Steel poles weigh approximately 30,000 pounds to 60,000 pounds but are normally shipped in three to four sections to reduce the weight of each shipment to less than 15,000 pounds, requiring fewer improvements and reinforcements to access roads during the construction phase.

As discussed earlier, underground cable systems require regular inspections from the ground in place of the aerial inspections used for overhead transmission. This requires permanent access paths to conduct the inspections. In addition, the cable joints are the most likely points of failure after damage by a third party. This requires the ability to quickly reach and evaluate joints to confirm the location of the fault.

The equipment required to make a repair is the same as the equipment used in the original construction and would require similar access requirements.

Matting is generally a temporary measure unlikely to withstand expected weather conditions over the course of a year. Stabilized permanent matting has very similar impacts to permanent stabilized access roads.

**QUESTION 7, HOW THE DETERMINATION WAS MADE THAT A 75-FOOT WIDE CLEARED WIDTH WOULD BE NECESSARY FOR A POTENTIAL UNDERGROUND LINE.**

As described in my rebuttal testimony, the cables need to be kept out of the roots of large vegetation and out of the root influence area to prevent long-term impacts to cable operation. The size of the root influence area varies with tree species, size, and soil conditions.

General guidelines for approximation are available. For tall trees with deep root systems such as oak or maple the main root system is expected to be roughly 2/3rds the spread of the crown, with additional filament roots impacting moisture content out to the full width of the canopy. For shorter trees with shallower root systems, such as spruce, the width of the root system area of impact is roughly the same as the height of the tree.<sup>2</sup>

For both types of trees in Maine the general guidance results in an impact area of nearly 35 feet. Allowing for a 5-foot trench with 35 feet on either side gives a total width of 75 feet. See exhibit CMP-11.1-C for a diagram of the expected root areas.

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<sup>2</sup> Lily, Sharon J.(2001). Arborist Certification Study Guide: Tree Biology. International Society of Arboriculture. Champaign, IL. ADR BookPrint. Wichita, KS.

**QUESTION 8, WHETHER THERE IS MORE CLEARED AREA WITH A 150-FOOT WIDE OVERHEAD LINE OR WITH A 75-FOOT WIDE UNDERGROUND LINE INCLUDING TERMINATION STATIONS.**

Total clearing area would be lower with underground construction more than a few thousand feet long. However, total cleared area does not represent the full extent of environmental impacts, nor does it determine the reasonableness of the alternative, as explained in my rebuttal testimony. The continuous nature of underground construction creates significantly more temporary impacts. In addition, the termination stations, access roads for the termination stations, access roads for the splice locations, and any vaults create new unvegetated impervious surface.

**QUESTION 9, EXPLANATION OF THE NUMBER OR PERCENTAGE OF CABLE FAULTS IN UNDERGROUND CABLES VS. OVERHEAD LINES.**

Due to the small quantity and relatively recent advent of polymer insulated HVDC cable in service there are no statistics on the reliability of polymer insulated HVDC cable. An international power research group, CIGRE, conducts industry surveys<sup>3</sup> on cable reliability every decade. Unfortunately the last published study is from 2009 and has limited data on polymer insulated cable in HVDC applications or data on extra high voltage AC cables (230kV and above).

Based on the limited data available, faults due to all causes for underground transmission lines (69kV and above) occurred approximately 0.141 times per year per 100 miles.

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<sup>3</sup> CIGRE Technical Brochure 379, Update of Service Experience of HV Underground and Submarine Cable Systems.

For overhead lines CMP has an estimated average of 0.53 faults per year per 100 miles at 345kV. This represents incidents where repair or remediation was required and excludes incidents where power was restored within seconds by reclosing. These data represent CMP's operating and vegetation management practices for overhead lines most similar to the proposed installation.

As described in my rebuttal testimony, the total number of faults does not provide an accurate representation of the differences in reliability. The vast majority of faults on overhead systems are minor and temporary, allowing for immediate restoration of the line to service. The faults requiring repair or remediation are relatively short, requiring hours or, at most, a few days to restore. In contrast, even very minor faults on an underground line will take the line out of service for a minimum of 2 weeks, with 4 to 6 weeks being more likely.

The Transmission Services Agreements for NECEC include a minimum availability requirement of 90% per month. CMP has an expected availability of overhead transmission lines at 345kV greater than 99%. A single outage on an underground line could violate those requirements, requiring additional costs related to installed spare cable to allow for quicker restoration. Even with the installed spare cable, some types of damage may take more than one cable out of service, requiring extended restoration periods and violating the required availability.

**QUESTION 10, WHETHER COOLING STATION STRUCTURES WERE INCLUDED IN THE UNDERGROUNDING COST ESTIMATES, WHAT SIZE OR TYPE OF STRUCTURE WOULD BE NEEDED, HOW MANY, AND AT WHAT DISTANCE ALONG THE LINE.**

No supplemental cooling has been included in the estimates or conceptual design. Supplemental cooling is not commonly used on solid dielectric cable systems, which is the type



of cable considered in the Kennebec River crossing, and I do not recommend the use of supplemental cooling on new lines.

Cooling is used to overcome localized ratings reductions such as a steam line crossing or unusual site conditions. All supplemental cooling systems are mechanical systems with additional maintenance requirements and lower reliability than the cable itself. When the cooling system fails, the line ratings would need to be reduced until repairs can be completed. Cooling systems add substantial cost and reliability concerns to a line. They are typically only proposed on existing lines as an alternative to replacing the line.

Supplemental cooling is usually accomplished by circulating chilled fluids through the cable conduits or pipes adjacent to the conduits. Cooling stations for solid dielectric systems consist of a water-glycol chilled water system with a circulating pump. They are above-grade structures with large condensing coils and fans, roughly 20 feet long, 8 feet high, and 6 feet wide. They require constant power and monitoring to stay in service. The distance they can mitigate varies substantially with the impact being mitigated, pipe volume available, and size of the cooling system. I am not aware of anywhere cooling has been used extensively on a solid dielectric system. Spot mitigation is more common.

Cooling is more commonly used on high-pressure fluid-filled cable systems (pipe-type). This is an older technology where paper insulated cables are installed in a steel pipe and pressurized with dielectric fluid. By circulating and cooling the dielectric fluid, localized ratings restrictions can be ignored. This type of cable system is not being proposed and is not suitable for NECEC.

**QUESTION 11, IDENTIFY ENGINEERING STANDARDS, SAFETY OR DESIGN CODES, ETC. THAT SPECIFICALLY APPLY TO THIS PROJECT**

I am responding only for the underground construction portion of the project. Please see Justin Tribbet's Supplemental Testimony for a listing of the standards applying to the rest of the Project.

There are relatively few prescriptive standards and design codes specific to underground HVDC cable due to the relatively recent innovations in HVDC cable. The National Electrical Safety Code (NESC) is the only prescriptive standard specific to underground cable systems and covers criteria such as minimum cover and protection for and from other utilities.

There are a few guidelines prepared specifically for HVDC cable and that are being applied to this project. Most of these have been published by the International Council on Large Electric Systems (Conseil International des Grands Réseaux Électriques, CIGRE). In particular, the Project is complying with CIGRE Technical Brochure 496, "Recommendations for Testing DC Extruded Cable Systems for Power Transmission at a Rated Voltage up to 500kV."

Several standard specifications can be used for both AC and DC cable. The Project is using the following standard specifications and guides that apply to both types of cable:

- IEEE 442 "Guide for Thermal Resistivity Measurements of Soils and Backfill Materials;"
- IEC 60060 "High-Voltage Test Techniques;" and
- IEC 60228 "Conductors of Insulated Cables."

A number of guidelines and procedures apply to the construction methods being proposed, including:

- ASTM F1962 "Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings,"
- EPRI "Underground Transmission Systems Reference Book," and
- CMP procedures for excavation and trenching activities.

**QUESTION 12, EXPLANATION OF THE CONDITIONS CONSIDERED WHEN ENGINEERS DETERMINED THAT HORIZONTAL DIRECTIONAL DRILLING WOULD BE THE LOWEST IMPACT TRENCHLESS METHOD FOR THE NECEC PROJECT.**

There are three trenchless methods commonly used in underground transmission, horizontal directional drilling (HDD), microtunneling, and pipe-jacking. HDD is already described in my rebuttal testimony. Microtunneling and pipe-jacking are similar straight line trenchless methods. Because these methods are unable to turn, crossings are completed by digging a shaft on either side of the obstacle and advancing a casing from shaft to shaft.

In microtunneling a hydraulic cutting head is used to open the hole ahead of the casing, and spoils are removed with a slurry system. In pipe-jacking a cutting head on the leading edge of the casing is used to open the hole, and spoils are removed with a mechanical auger or hand tools. In both cases a hydraulic ram is used to push the casing and cutting head through the soil.

Being guided, HDD allows for surface to surface crossing without opening shafts. HDD allows for the longest crossing distances, between 4,000 and 7,000 feet, depending on soils. HDD also has the lowest per foot cost of the trenchless methods.

Microtunneling allows for crossings up to 1,000 feet, with no minimum length. Microtunneling requires much of the same support equipment as an HDD installation to process the drilling fluid used, requiring similar temporary work areas. Because microtunneling is limited to straight lines and limited distances it is not suitable for the potential crossings along the NECEC route. Microtunneling also has the highest cost of the trenchless methods, because of the shafts and expensive cutting heads.

Pipe-jacking has the lowest overall cost of the trenchless methods due to the minimal support equipment, reduced site work, and no minimum distance. Pipe-jacking is typically limited to 250- to 500-foot distances, depending on soils. In addition, pipe-jacking is an open-face tunneling method. There is no ability to prevent ground water from entering the casing at the cutting head and washing out soils. Removal of rock or boulders requires personnel to enter the casing. For this reason pipe-jacking is generally limited to installations in softer soils above the water table. Pipe-jacking has the shortest reach, and it cannot be used in saturated soils and therefore is not suitable for the potential crossings along the NECEC route.

**QUESTION 19, WHAT THE COSTS WOULD BE TO UNDERGROUND FEWER LONGER SECTIONS (VERSUS MORE SHORTER SECTIONS) OF THE LINE (TO MINIMIZE TRANSITION STATIONS AND ENVIRONMENTAL IMPACT) AS WELL AS OTHER PRACTICAL CONSTRAINTS TO THIS APPROACH.**

Based on the estimates prepared, underground transmission costs approximately \$15.9 million per mile compared to \$2.1 million per mile for overhead, or 7.6 times as much as overhead. Specific areas will have higher costs for the underground segment if trenchless installation methods are required or substantial rock is encountered. Although fewer longer underground sections would have fewer termination stations than more shorter underground sections, neither alternative is practicable or less environmentally damaging than the proposed overhead line.

As discussed in my rebuttal testimony, undergrounding the line will significantly increase temporary environmental impacts, will adversely impact system reliability and availability, and will increase impacts to the public during construction.

**QUESTION 20, COMPARISON OF COST FOR CONSTRUCTING A CRANE PATH TO EVERY POLE LOCATION (OVERHEAD LINES) WITH THE COST TO CONSTRUCT AN ACCESS ROAD TO EVERY SPLICE BOX (UNDERGROUNDING).**

The initial costs would be similar. Temporary matting suitable for overhead construction costs approximately \$500,000 per mile. Permanent gravel access roads have roughly the same cost, at approximately \$450,000 per mile. The main cost difference would be the future maintenance of the permanent access roads for underground construction, adding additional costs through the life of the project.

**QUESTION 26, WHETHER AN UNDERGROUND ROUTE CO-LOCATED WITH ROUTE 201 WOULD BE TECHNICALLY FEASIBLE, ECONOMICALLY VIABLE, AND/OR A SATISFACTORY OPTION TO MITIGATE CONCERNS RAISED DURING THE HEARING.**

In general terms, construction of underground transmission in a highway is technically possible, but that does not mean it is feasible. Underground transmission is often installed in existing road rights-of-way. However, the installation of splicing vaults in travel lanes of highways is prohibited by the Maine Department of Transportation (MDOT)<sup>4</sup> and there is insufficient room adjacent to the travel lanes for installation of the splicing vaults outside of the travel lanes. MDOT is also resistant to installation of longitudinal installations in highways, although exceptions have been approved in the past.

Depending on how much of Route 201 is being used, there are also concerns with relocating the interconnection point with Hydro Quebec. It is not clear that a matching route could be developed on the Quebec side of the project. The study and evaluation to confirm the feasibility of the route on both sides of the border would take an extended period of time, running to at least several years.

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<sup>4</sup> Maine Department of Transportation Utility Accommodation Rules, 17-229 CMR Chapter 210, Section 10, Subsection 5, Part D.



As previously discussed, the cost for underground construction, particularly in highways, would greatly increase the cost of the project and would not be economically viable.

## **II. APPENDIX B TO THE TENTH PROCEDURAL ORDER**

Appendix B to the Tenth Procedural order included requests for additional supporting data. In this supplemental testimony I will respond to the items specific to underground construction methods.

### **ITEM 3, A PLAN SHOWING THE ALTERNATE ROUTE NOTED IN SECTION 3 OF MR. BARDWELL'S REBUTTAL TESTIMONY.**

Please see the attached exhibit CMP-11.1-D.

### **ITEM 4, FOR ALL THE COST ESTIMATE SUMMARY SHEETS IN THE REBUTTAL TESTIMONY, PLEASE PROVIDE ADDITIONAL BACKUP SPREADSHEETS OR DETAILS FOR HOW EACH OF THE LINE ITEM COSTS WERE DETERMINED.**

As discussed in Justin Tribbet's supplemental testimony, the underground cost estimates were based on ISO-NE procedures for conceptual estimates. The underground estimates were built by estimating quantities for all of the equipment and labor and applying unit prices to each item.

In general, the specific unit cost data were gathered from past projects, including +/- 320kV HVDC, 230kV AC, and 345kV AC projects proposed or built within the last three years. Because +/-320kV HVDC cable is similar in size to 345kV AC cable the costs for civil construction are very similar. The cable system costs were taken from manufacturers' proposals for similar +/-320 kV HVDC projects in the last two years. All costs were corrected for escalation between the time of proposal/contracting and the time of estimate.

Going through the summary sheet provided with my rebuttal testimony:

- Cable System Furnish and Install – Includes all of the material and installation costs for the cable system itself.
- Communications – Includes the material and installation costs for the fiber-optic cables.
- Civil Work – Includes all costs to prepare a trench or duct bank system for cable installation and connection to the overhead line and restoration after installation.
  - General Subtotal – Includes mobilization, surveying and staking.
  - Splicing Vault or Jointing Location Subtotal – Includes costs for preparing the jointing locations, installing pre-cast concrete vaults and bays, backfilling, and restoration.
  - Direct Buried – Includes costs for opening and maintaining the trench, preparing bedding sand, backfilling the trench, establishing and maintaining soil erosion and sedimentation control, and restoration after construction.
  - Duct Bank Subtotal - Includes costs for opening and maintaining the trench, furnishing and installing conduit and spacers, concrete encasement, backfilling the trench, establishing and maintaining soil erosion and sedimentation control, and restoration after construction.
  - HDD Installation Subtotal – Includes costs furnishing and installing pipes by HDD for the identified or assumed crossings.
- Escalation – Estimated increase in costs due to inflation.
- Mark-Up – Allowance for prime contractor profit.
- Contingency – Allowance for unidentified changes in scope during design and construction.
- Topographic Surveying/Soil Exploration – Additional cost required to get additional survey and geotechnical data suitable for designing underground transmission installations.
- Engineering and Technical Support During Construction – Includes estimated cost for design of the underground transmission line, management of the design process, and additional permitting.
- Construction Management – Inspection, supervision, tracking, and management of construction activities by the prime contractor and CMP.
- Insurance and General Expenses – Cost for Builders All-Risk and General Liability insurance.

The quantities and assumed site conditions used as the basis of the estimate are identified on the assumptions sheet attached to each estimate.

Exhibits

CMP-11.1-A Underground Construction, Typical Sections, and Plans


CMP-11.1-B Pictures of Similar Installations

CMP-11.1-C Diagram of Expected Root Areas

CMP-11.1-D Underground Alternate Route Map

Dated: 4/25/19

Respectfully submitted,


  
Justin Bardwell

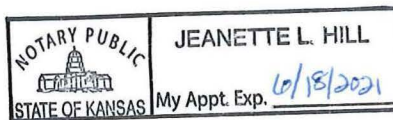
STATE OF KANSAS  
Johnston County, ss.

The above-named Justin Bardwell did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Before,

Dated: 4/25/2019

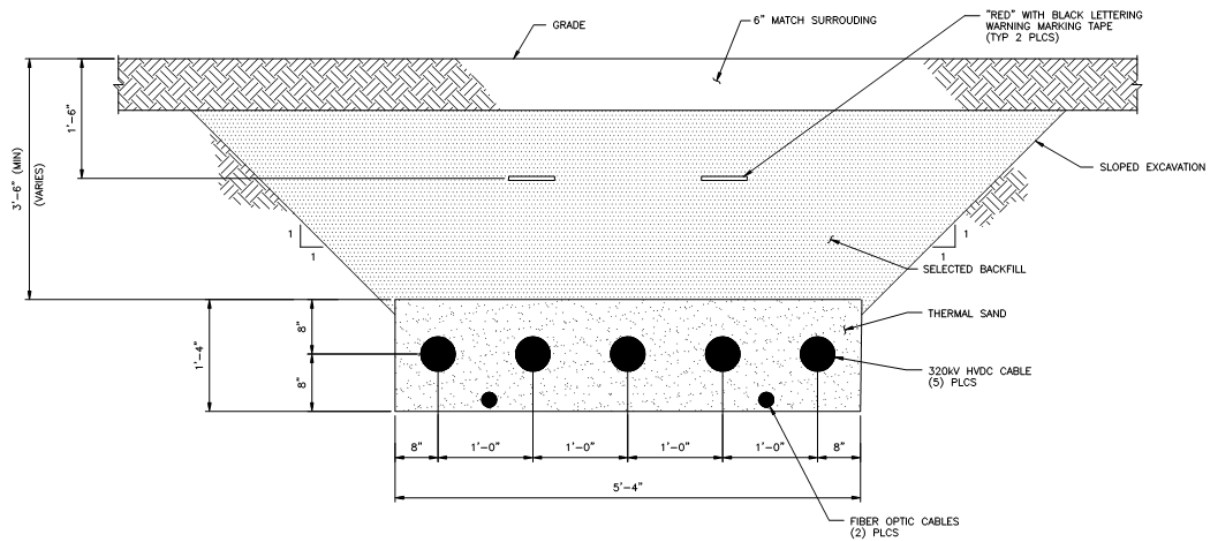
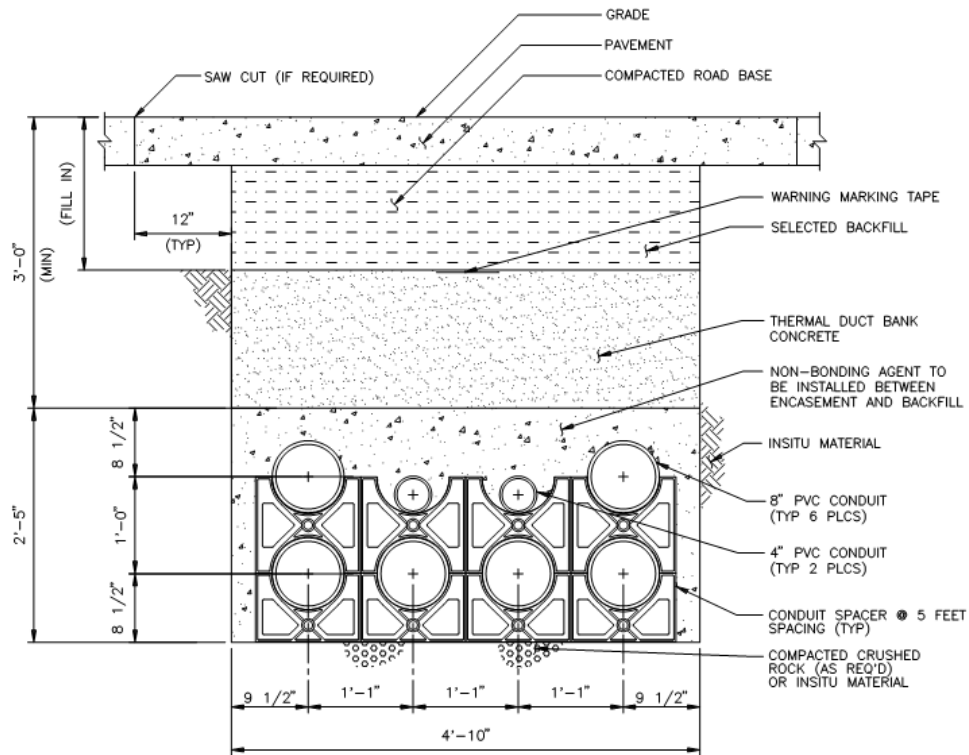
  
Notary Public  
Name: Jeanette L. Hill  
My Commission Expires:



**CMP-11.1-A**  
**Bardwell Supplemental Testimony**  
**Typical Sections, Dimensions and Drawings**

|                                                            |   |
|------------------------------------------------------------|---|
| Figure 1- Typical Duct Bank Section .....                  | 2 |
| Figure 2- Typical Direct Buried Section .....              | 2 |
| Figure 3- Typical 320kV HVDC Splicing Vault .....          | 3 |
| Figure 4- Typical 320kV HVDC Splicing Vault End Wall ..... | 4 |
| Figure 5- Typical HDD Cross-Section .....                  | 5 |
| Figure 6 - HDD Work Process .....                          | 5 |
| Figure 7- Typical HDD Work Area, Entry Side .....          | 6 |
| Figure 8 - Typical HDD Work Area, Exit Side .....          | 6 |
| Figure 9 - Typical Microtunneling Sections .....           | 7 |
| Figure 10 - Typical Bore Casing Sections .....             | 7 |





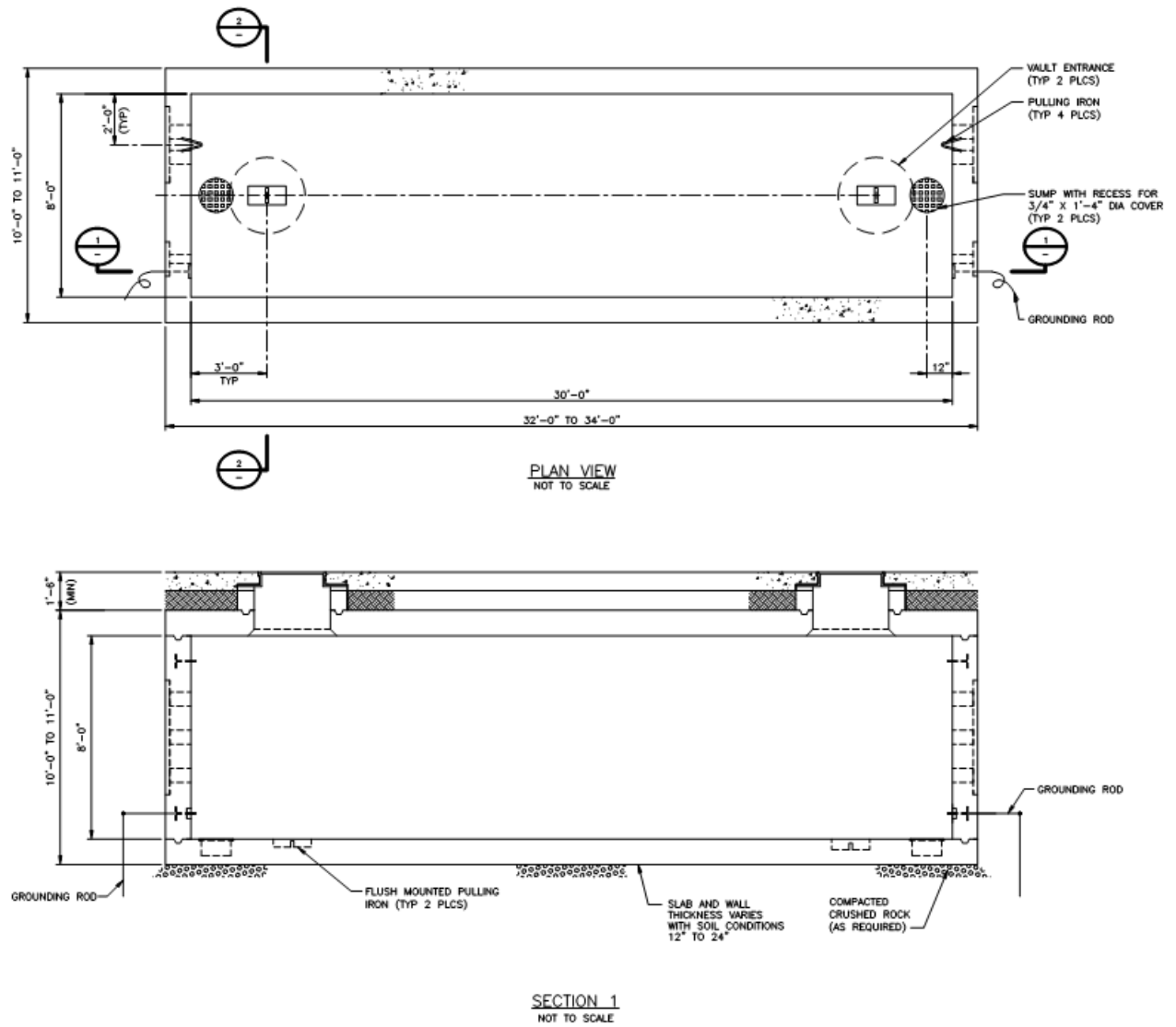
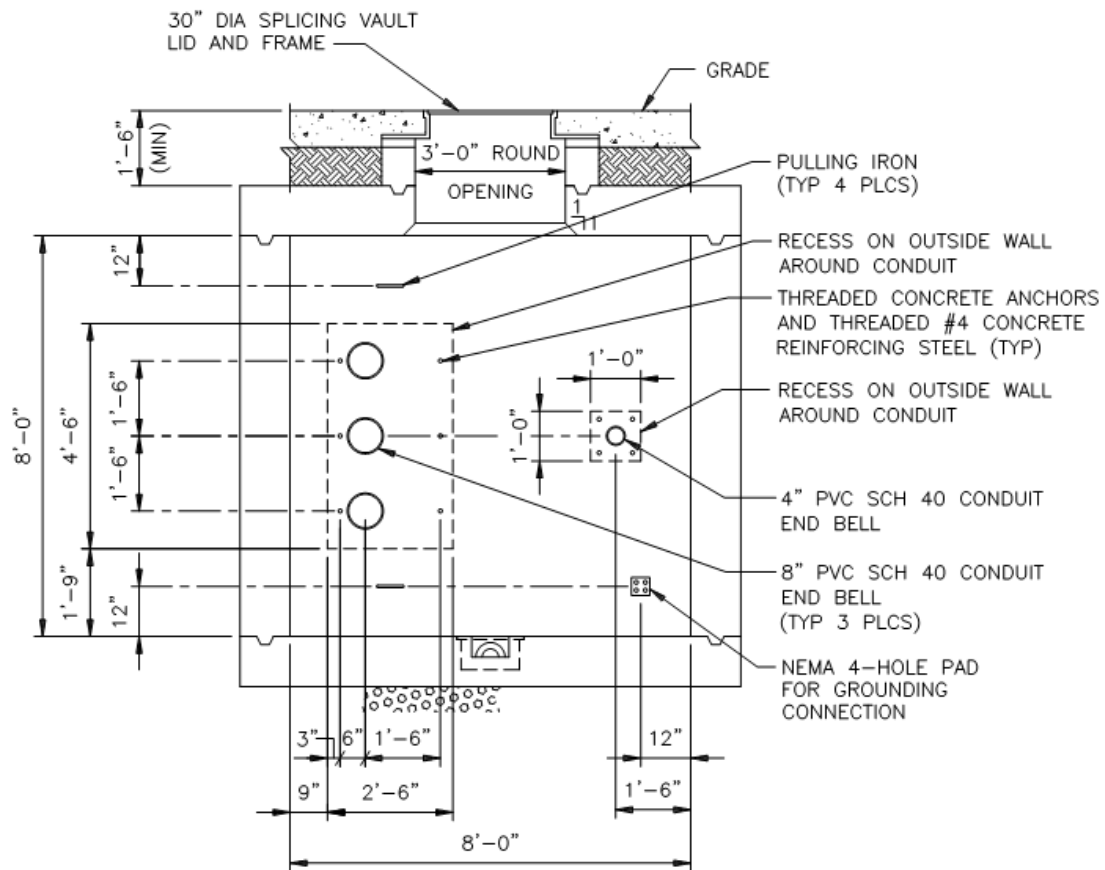


Figure 3- Typical 320kV HVDC Splicing Vault



SECTION 2  
NOT TO SCALE

Figure 4- Typical 320kV HVDC Splicing Vault End Wall

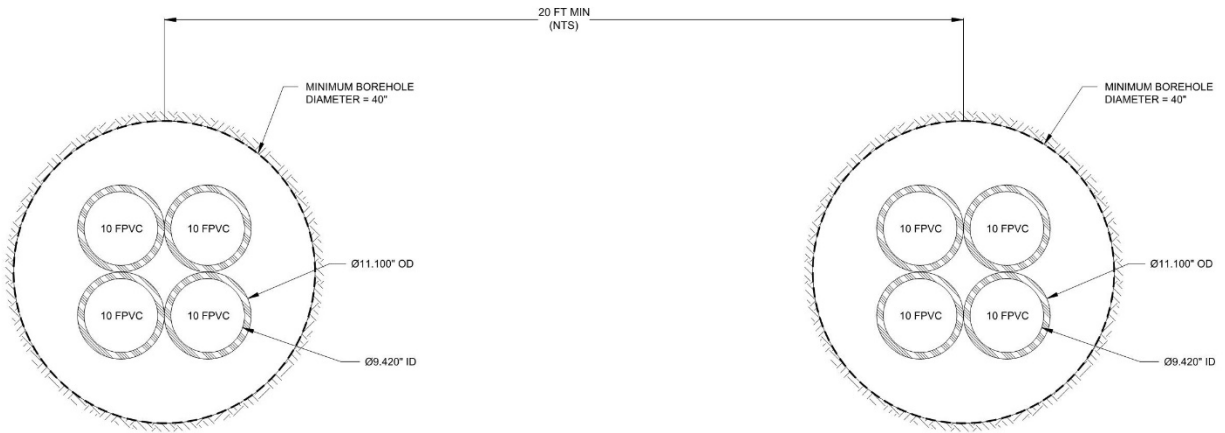


Figure 5- Typical HDD Cross-Section

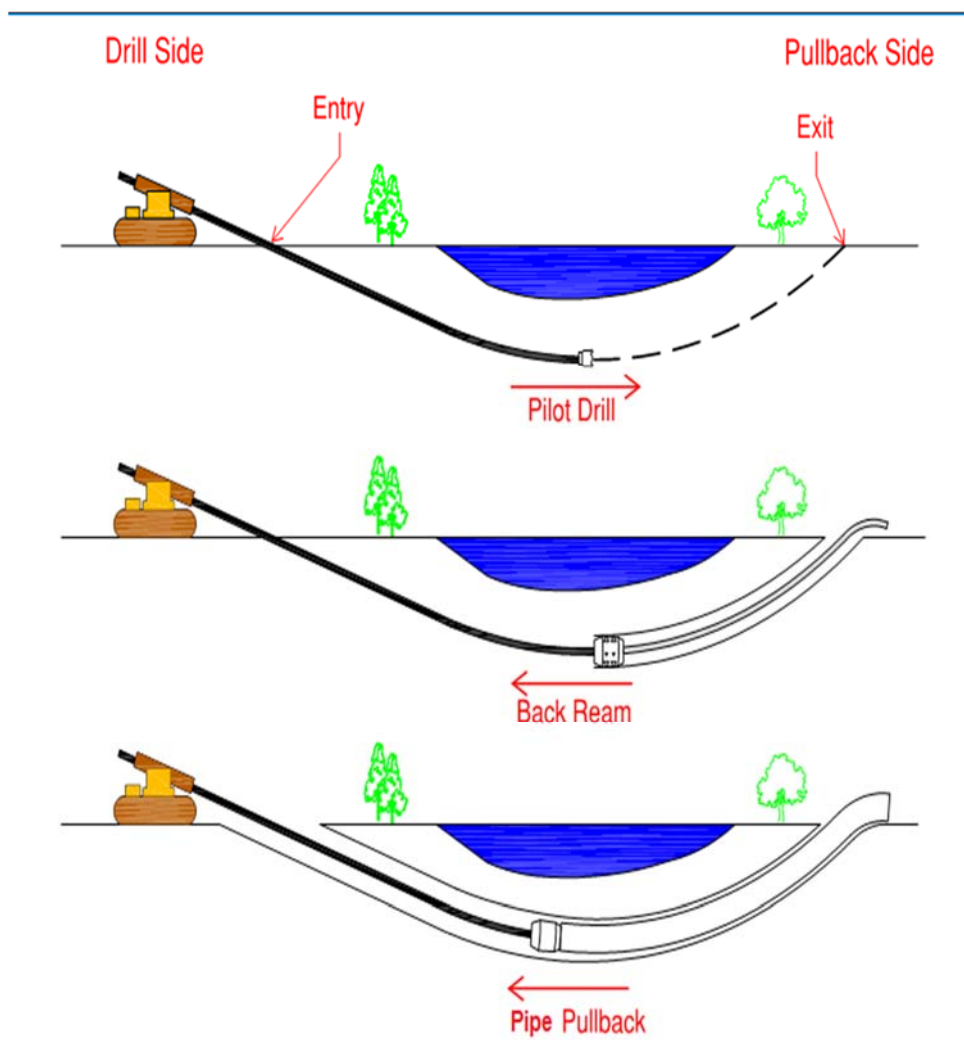


Figure 6 - HDD Work Process

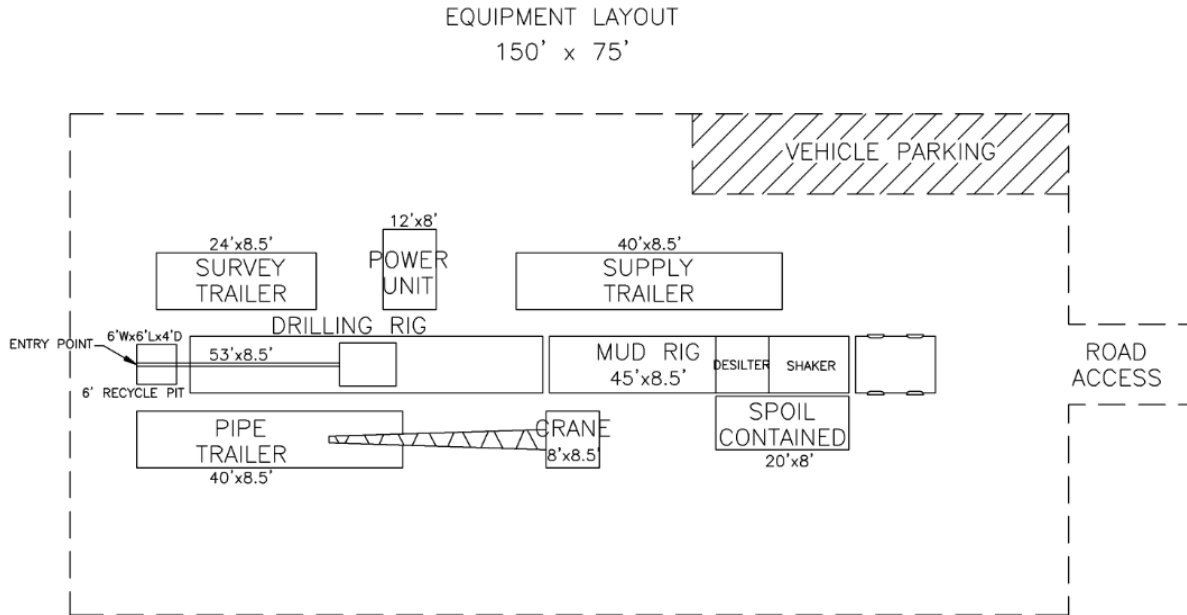
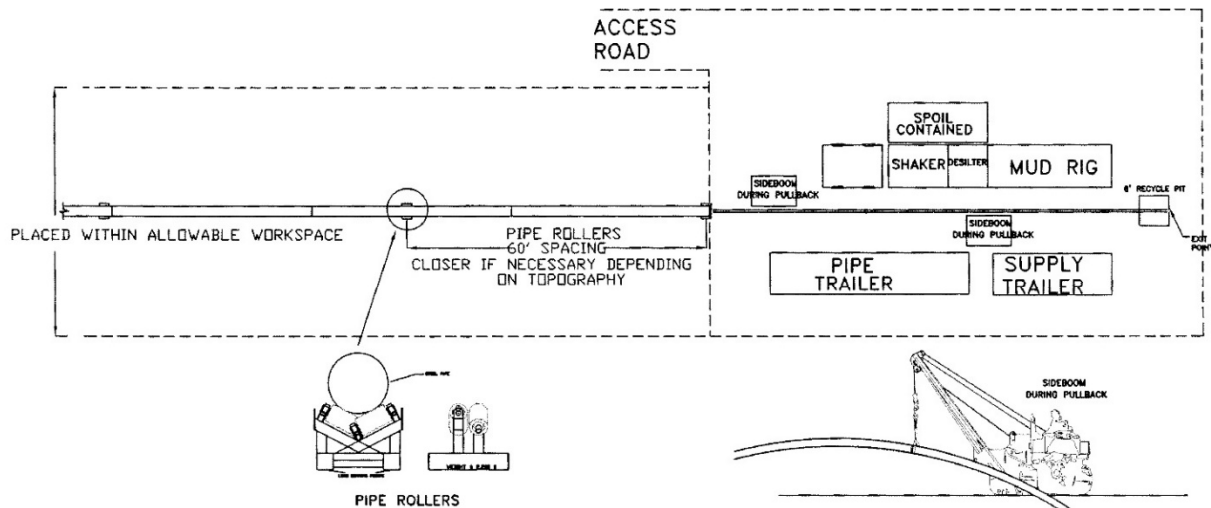


Figure 7- Typical HDD Work Area, Entry Side



NOTE: THIS IS A TYPICAL SITE SET-UP. THERE ARE VARIOUS CONFIGURATIONS USED DEPENDING UPON SITE RESTRICTIONS. FIELD MODIFICATIONS MADE TO SUIT THE SITE.

Figure 8 - Typical HDD Work Area, Exit Side



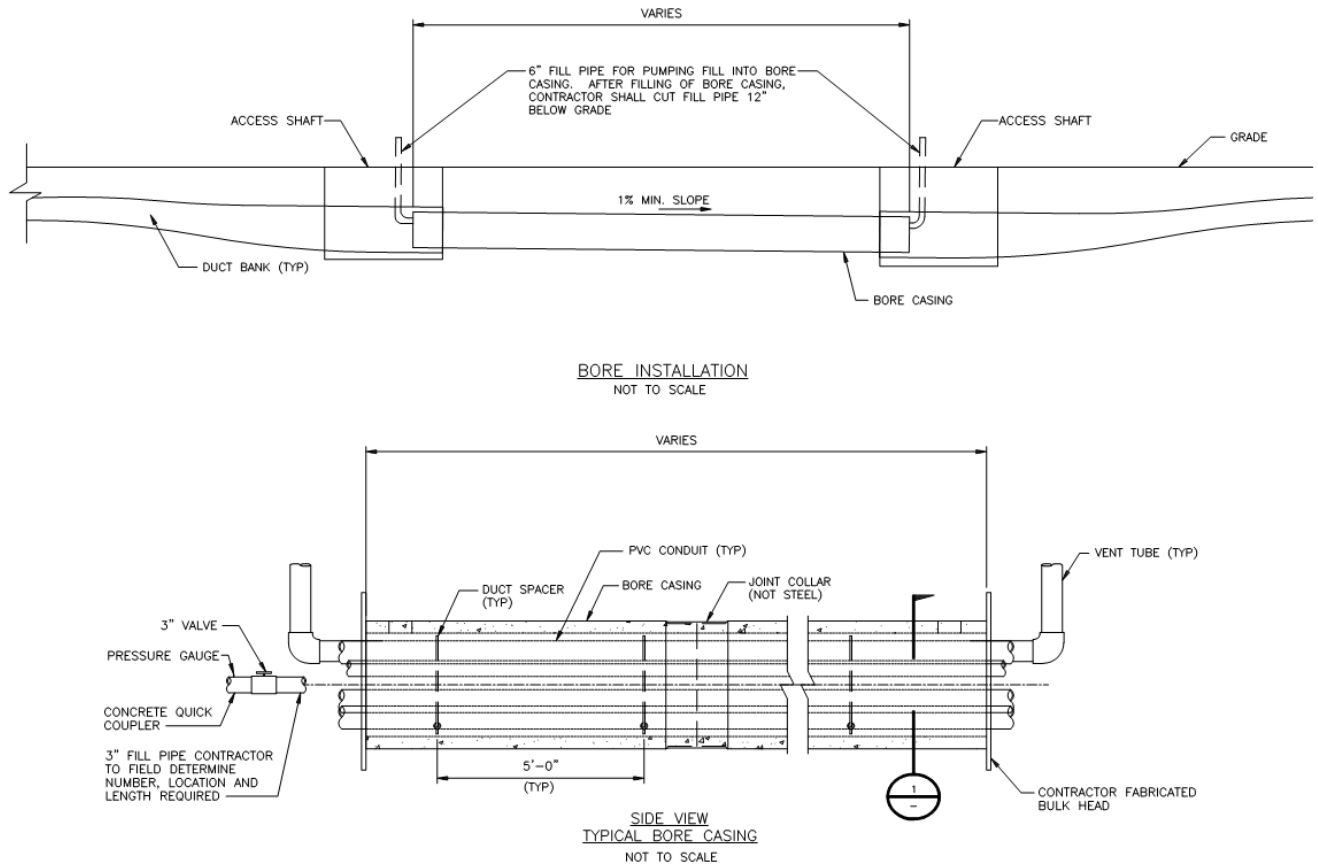


Figure 9 - Typical Microtunneling Sections

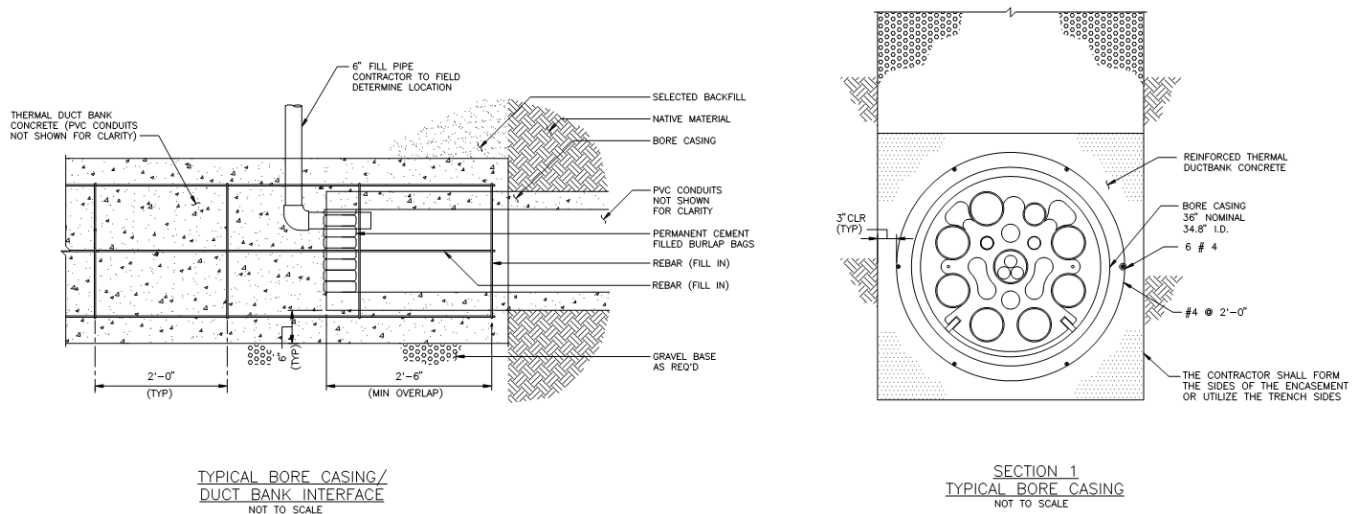


Figure 10 - Typical Bore Casing Sections

**CMP-11.1-B**  
**Bardwell Supplemental Testimony**  
**Pictures of Similar Installations**

|                                                                     |    |
|---------------------------------------------------------------------|----|
| Figure 1 - Duct Bank Excavation.....                                | 2  |
| Figure 2- Duct Bank Excavation.....                                 | 3  |
| Figure 3 - 500kV Splicing Vault.....                                | 4  |
| Figure 4- 115kV Splicing Vault.....                                 | 4  |
| Figure 5- 115kV Splicing Vault.....                                 | 5  |
| Figure 6 - Horiztonal Directional Drill Rig.....                    | 5  |
| Figure 7 - HDD Drill Rig.....                                       | 6  |
| Figure 8 - Pipe Jacking Shaft.....                                  | 6  |
| Figure 9- Pipe-Jacking Shaft .....                                  | 7  |
| Figure 10-Oversized Reel Transport, 4,724 feet of 230kV Cable ..... | 7  |
| Figure 11 - Cable Reel Trailer .....                                | 8  |
| Figure 12- Cable Pulling over Bullwheel .....                       | 8  |
| Figure 13 - Preparing Cable for Jointing.....                       | 9  |
| Figure 14 - Assembling Joint .....                                  | 9  |
| Figure 15 - Cable Joints in Vault.....                              | 10 |



*Figure 1 - Duct Bank Excavation*





*Figure 2- Duct Bank Excavation*



*Figure 3 - 500kV Splicing Vault*



*Figure 4- 115kV Splicing Vault*





*Figure 5- 115kV Splicing Vault*



*Figure 6 - Horizontal Directional Drill Rig*





Figure 7 - HDD Drill Rig



Figure 8 - Pipe Jacking Shaft





Figure 9- Pipe-Jacking Shaft



Figure 10-Oversized Reel Transport, 4,724 feet of 230kV Cable

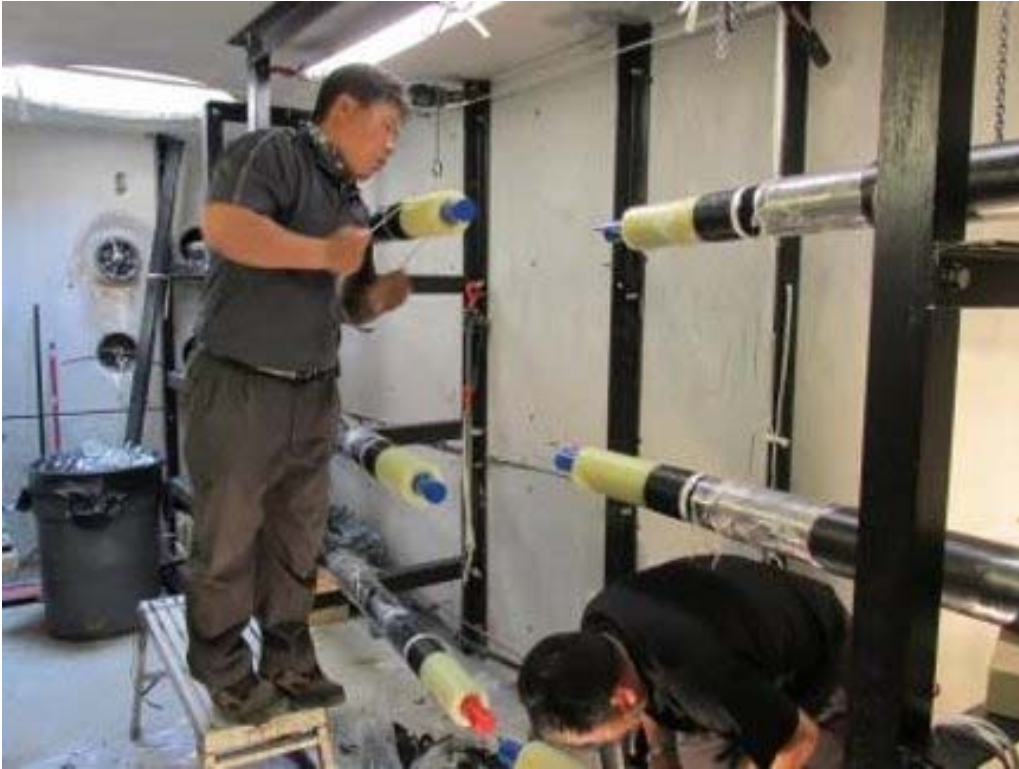




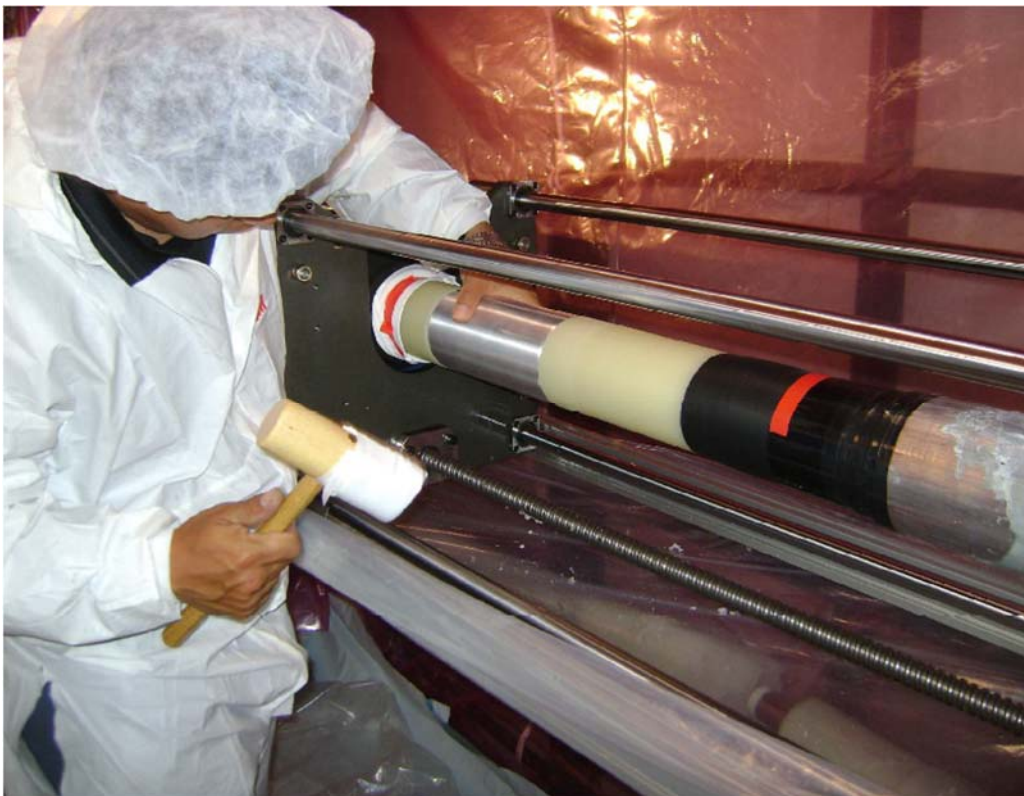
Figure 11 - Cable Reel Trailer



Figure 12- Cable Pulling over Bullwheel



*Figure 13 - Preparing Cable for Jointing*



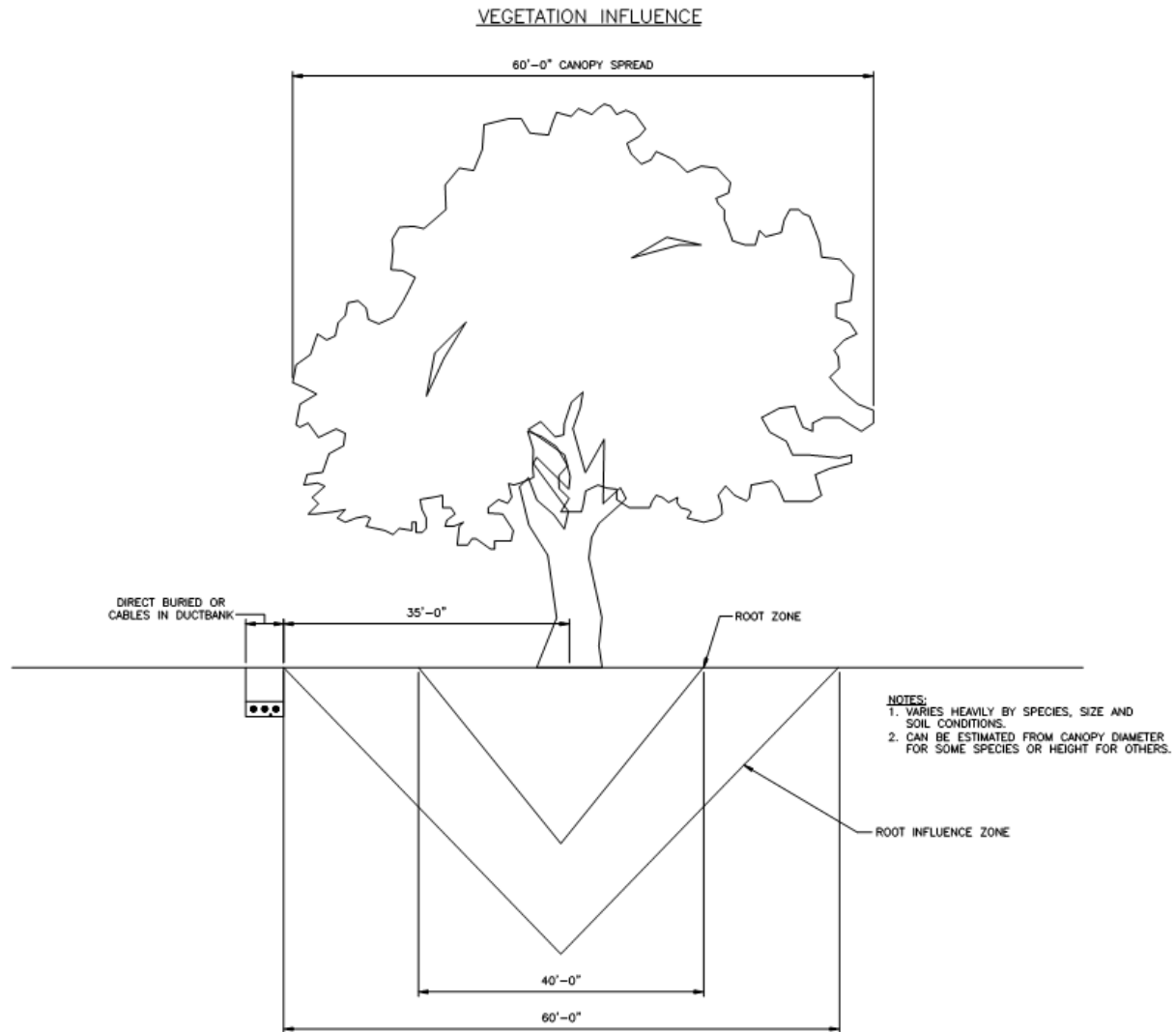
*Figure 14 - Assembling Joint*





*Figure 15 - Cable Joints in Vault*

**CMP-11.1-C**  
**Bardwell Supplemental Testimony**  
**Root Influence Area**




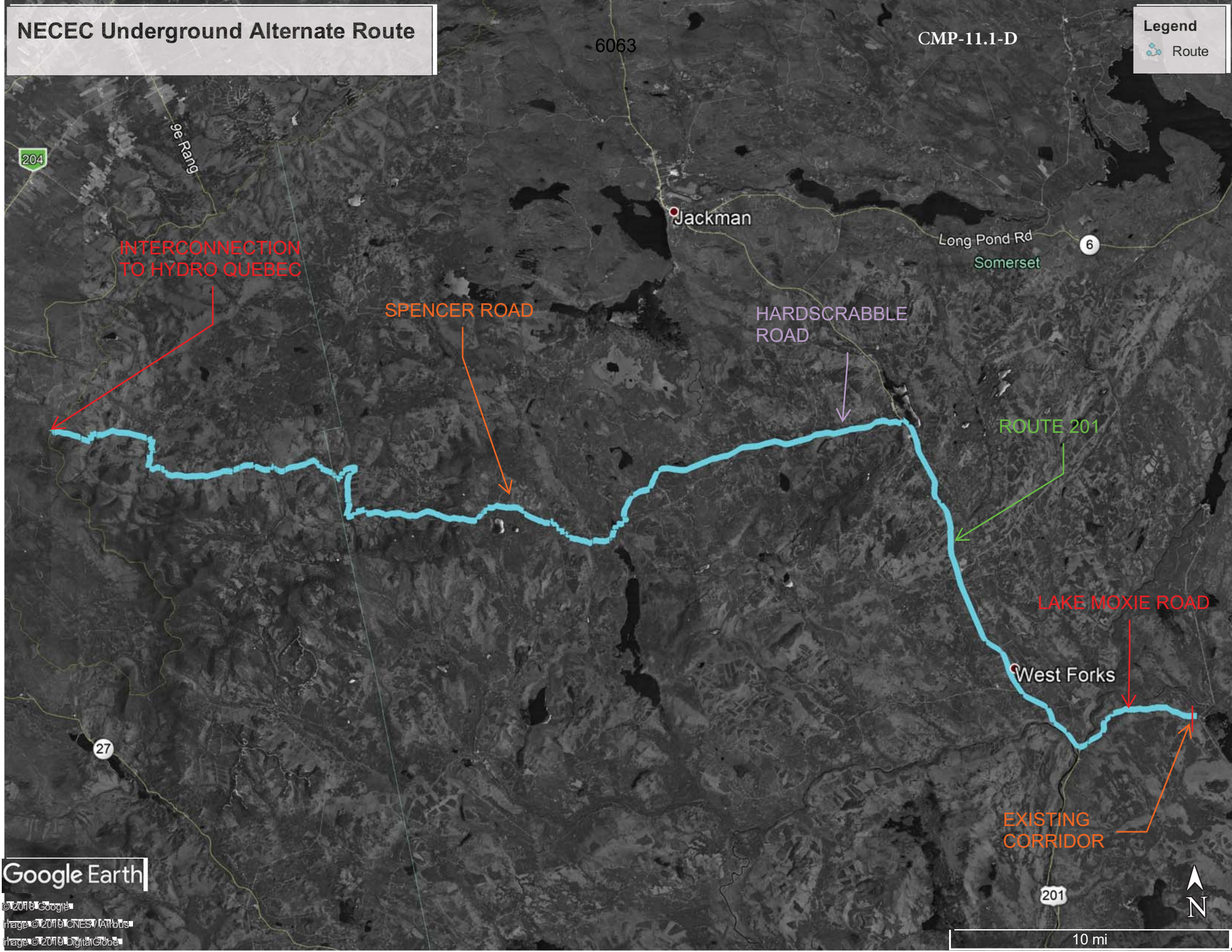


NECEC Underground Alternate Route

CMP-11.1-D

Legend

 Route



STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED SUPPLEMENTAL TESTIMONY AND EXHIBITS OF  
NICHOLAS ACHORN

May 1, 2019

This testimony is in response to certain of the Construction Questions in Appendix A to the Tenth Procedural Order.

**WITNESS QUALIFICATIONS (Relevant to DEP and LUPC Review)**

I am a Project Manager for Black & Veatch Energy Division's Power Delivery Business Line. I am currently the Project Manager focused on the DC transmission line for the New

England Clean Energy Connect (NECEC) Project (Project). I graduated from the University of Maine at Orono with a Bachelor of Science in Civil Engineering and a minor in Construction Management Technology, in 2008. I have been employed as a Project Engineer, Engineering Manager, or Project Manager for Black & Veatch since 2014. I attached my CV as Exhibit CMP-13-A.

**QUESTION 2: DESCRIPTION OF CONSTRUCTION PROCESS, STAGING, AND IMPACTS FOR 100-FOOT OR TALLER POLES.**

Poles will be delivered in sections (e.g., 120-foot poles will comprise at least three separate sections), so having 100-foot or taller poles will not by itself impact the access requirements for delivery to the planned installation location. However, an increase in pole height for the full-height vegetation area will require an otherwise directly embed structure to instead require a caisson foundation to support additional loads from this height increase (e.g., larger permanent footprint, additional equipment required to transport concrete, etc.). These full-height vegetation areas will have more impact on the construction access and sequence plans to accommodate the additional equipment required.

These 100-foot or taller poles can have their respective pole sections connected while being erected, and only the hydraulic crane and man-lift equipment need to be sized to appropriately handle the height requirements. The typical temporary work pads for structure installation proposed by CMP vary by structure type, and are sized to handle the appropriate materials and equipment required, as shown in Figure 7-1 of the Natural Resources Protection Act permit application. As shown on Figure 7-1, the structures contained within the full-height vegetation areas (i.e., additional height increase to maintain clearances while increasing anticipated loads at structure base) will change from direct embed to requiring a caisson



foundation, but that change will not impact the work pad size requirements. See the following discussion for a high-level overview of the sequencing required to install either a directly embed structure or a structure set atop a concrete caisson foundation.

**Directly Embed Structure Type:** Construction material will be received and handled at the appropriate laydown yard. Material will be hauled via flatbed from the laydown yard to the proposed installation site. Soil will be excavated, the base of the pole will be set, and the hole will be backfilled. Using a hydraulic crane in conjunction with a man-lift, the remaining sections of pole and farming hardware will be installed.

**Structure On Caisson Foundation Type:** Construction material will be received and handled at the appropriate laydown yard. Material will be hauled via flatbed from the laydown yard to the proposed installation site. Soil will be excavated, rebar and anchor bolt cage will be set, and concrete will be poured. Using a hydraulic crane in conjunction with a man-lift, remaining sections of pole and framing hardware will be installed.

#### Exhibits

CMP-13-A: Achorn CV

Dated: 4/25/2019

Respectfully submitted,



Nicholas Achorn

STATE OF MAINE  
Kennebec, ss.

The above-named Nicholas Achorn did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Dated: 4/25/2019

Before,



Notary Public

Name: PATRICIA Ann LARRIVÉE

My Commission Expires:

4-7-2026

## Nicholas Achorn, P.E.

Nicholas Achorn is a Project Manager for Black & Veatch Energy Division's Power Delivery Business Line. His experience includes the management of engineering teams for both overhead and underground design as well as previous experience performing overhead transmission line design for voltages ranging between 34.5kV to 500kV.

### PROJECT EXPERIENCE

#### **CMP; NECEC; Maine, United States; 2018-In-Progress**

**Project Manager - Black & Veatch.** Project Manager of the 320kV DC overhead transmission line.

#### **AEP; Gravel Pit; South Bend, Indiana, United States; 2017-2018**

**Engineering Manager - Black & Veatch.** Engineering Manager responsible for the design and construction of two new 138kV overhead transmission lines, Gravel Pit West (approximately 3.3 miles) and Gravel Pit East (approximately 4.1 miles), as well as the removal of approximately 4.5 miles of 34.5kV line.

#### **PPL EU; Williams Grove - West Shore, Pennsylvania, United States; 2015-2018**

**Engineering Manager / Section Lead - Black & Veatch.** Engineering Manager for all work associated with PPL EU. Section Lead responsible for the coordination and execution of designing multiple transmission lines ranging in voltage from 69 kV to 230 kV. Responsibilities included presentations of deliverables to the client, mentoring of junior engineers in the design of their respective projects, and QA/QC throughout the design process.

#### **National Grid; Greater Boston, Massachusetts, United States; 2014-2018**

**Engineering Manager - Black & Veatch.** Project Lead responsible for the overhead T-line design of multiple projects, from start to finish. Responsibilities included client interface and the mentoring of junior engineers through the design and construction process.

#### **National Grid; New York MSA Projects; New York, United States; 2014-2018**

**Assistant Project Manager - Black & Veatch.** Responsible for six overhead transmission line asset condition projects in New York, ranging in voltage from 34 kV to 115 kV. Project work included structure replacement, reconductors, rebuilds, reroutes, APA permitting, and Article VII permitting.

#### **Tenaska; Westmoreland, Pennsylvania, United States; 2015-2017**

**Overhead Transmission Line Engineering Manager - Black & Veatch.** Overhead Transmission Line Engineering Manager responsible for 500 kV overhead transmission line EPC scope. Project is 1.5 miles of new 500 kV in new right-of-way connecting to a new switchyard and generation substation.

### PROJECT MANAGER

#### **Expertise:**

Overhead Transmission;  
Project Management

#### **Education**

Bachelor of Science, Civil Engineering, University of Maine at Orono, 2008

#### **Professional Registration**

License, Civil, #83275, Ohio, 2018

License, Civil, #PE11800205, Indiana, 2018

License, Civil, #096677, New York, 2016

License, Civil, #83320, Pennsylvania, 2015

License, Civil, #14666, New Hampshire, 2015

License, Civil, #102908, Vermont, 2014

License, Civil, #51024, Massachusetts, 2014

License, Civil, #13289, Maine, 2013

#### **Total Years of Experience**

11

#### **Black & Veatch Years of Experience**

5

#### **Professional Associations**

American Society of Civil Engineers (ASCE) - Member

#### **Language Capabilities**

English

#### **Office Location**

Maine, USA

**United Illuminating; Milvon - West River Railroad Study; Connecticut, United States; 2015-2016**

**Project Engineer - Black & Veatch.** Project Engineer responsible for modeling and analysis of railroad catenary structures spanning the Metro North Railroad. Activities included overseeing team of engineers to model the overhead transmission line wires for load development in PLS-CADD and the modeling and analysis of the catenary structures in RISA.

**Eversource; Confidential; Massachusetts, United States; 2015-2016**

**Project Engineer - Black & Veatch.** Project Engineer responsible for the conceptual design of a new 115 kV steel monopole design within a new corridor. This new corridor follows a retired rail line and was expected to be converted to a walking path where special consideration to clearances and overall layout is paramount. Responsibilities included coordinating with the client to set up project status meetings and overseeing of junior engineers to complete necessary design and modeling within PLS-CAD, PLS-POLE, and PLS-TOWER. Additional responsibilities included support of the client for permitting activities.

**Eversource; 211-503/504 Reconductor; Massachusetts, United States; 2015-2016**

**Project Engineer - Black & Veatch.** Project Engineer responsible for the conceptual design of a 115 kV reconductor. Existing structure types are lattice towers which required member modifications and foundation reinforcements to withstand additional loads and tower extensions or full structure replacements to achieve required clearances. Responsibilities included coordinating with the client to set up project status meetings and overseeing of junior engineers to complete necessary design and modeling within PLS-CAD, PLS-POLE, and PLS-TOWER.

**Public Service of New Hampshire (PSNH); F107; New Hampshire, United States; 2013**

**Project Lead Engineer - POWER Engineers, Inc.** Feasibility study performed on a potential 12-mile line which would run from Madbury, New Hampshire, to Portsmouth, New Hampshire, 2 miles of which would run underground and underwater crossing a bay. Subcontracted LiDAR company and coordinated the effort required in obtaining survey for the applicable swath. LiDAR deliverable required a review of the aerial plan view imagery, oblique imagery, as well as the planimetrics and .XYZ points and feature codes. Cross sections developed for existing and proposed design/construction in parallel with cost estimates for internal PSNH review.

**Public Service Electric & Gas; Lumberton, New Jersey, United States; 2013**

**Independent Reviewer - POWER Engineers, Inc.** Performed QA/QC on PLS-CADD, PLS-Pole, and PLS-TOWER models, as well as all construction IFC documents.

**Baltimore Gas & Electric; Graceton, Maryland, United States; 2013**

**Independent Reviewer - POWER Engineers, Inc.** Performed QA/QC on PLS-CADD, PLS-Pole, and PLS-TOWER models.

**Central Maine Power; Maine Power Reliability Project; Maine, United States; 2013**

**Independent Reviewer - POWER Engineers, Inc.** Performed QA/QC on PLS-CADD and PLS-Pole models, as well as all construction IFC documents.

**Central Maine Power; Section 54 Lightning Arrester Installation; Maine, United States; 2012-2013**

**Project Lead Engineer - POWER Engineers, Inc.** Coordination with studies team to review Vaisala lightning data in determining a remediation and protection plan for 26 miles of existing 34.5 kV transmission line against lightning strikes. Once area of remediation was approved by owner, assembly drawings, material orders, and work lists were developed for the installation of lightning arresters on these existing structures.

**Public Service of New Hampshire; Y170; New Hampshire, States; 2011-2013**

**Project Lead Engineer - POWER Engineers, Inc.** PLS-CADD and PLS-Pole modeling for a rebuild of 9 miles of existing 34.5 kV distribution, as well as 7 miles of new 115 kV transmission line; approximately 3 miles of the 115 kV was double circuited with the 34.5 kV. Incorporation of client standards, as well as development of non-standard structures and hardware. Foundation design and drawing utilizing known field conditions and L-Pile software. Performance drawing development and coordination with steel pole vendor on their steel pole and anchor bolt cage design, as well as the switch manufacturer to verify allowable loading, attachment hardware and required dimensions. Coordination with drafting team to develop all required drawings. Attended numerous client meetings throughout the life of the project to review work completed, as well as forecast future required work. Assembly and submittal of IFC package to client. Construction support and site visits required throughout the construction process.

**Central Maine Power; Section 48 and Section 172 Rebuild; United States; 2011-2013**

**Project Lead Engineer - POWER Engineers, Inc.** PLS-CADD and PLS-Pole modeling for 16 miles of existing 34.5 kV single circuit rebuild designed to 69 kV transmission line standards. Incorporation of client standards, as well as development of non-standard structures and hardware. Foundation design and drawing utilizing known field conditions and L-Pile software. Performance drawing development and coordination with steel pole vendor on their steel pole and anchor bolt cage design, as well as the switch manufacturer to verify allowable loading, attachment hardware and required dimensions. Coordination with drafting team to develop all required drawings. Assembly and submittal of IFC package to client. Construction and field support, as well as submittal of record package.



### Central Maine Power; Saco Bay Reinforcement Project; United States; 2009-2012

**Design Engineer - POWER Engineers, Inc.** PLS-CADD and PLS-Pole modeling for a rebuild of 12 miles of existing 34.5 kV single circuit line rebuilt to double circuit 115 kV/69 kV standards, as well as a rebuild of 4 additional 34.5 kV single circuit sections rebuilt to 69 kV standards. Incorporation of client standards, as well as development of non-standard structures (for all double circuit) and hardware. Foundation design and drawing utilizing known field conditions and L-Pile software. Performance drawing development and coordination with steel pole vendor on their steel pole and anchor bolt cage design to verify allowable loading, attachment hardware and required dimensions. Coordination with drafting team to develop all required drawings. Assembly and submittal of IFC package to client. Construction and field support, as well as submittal of record package.

### Central Maine Power; Section 243; Maine, United States; 2009-2011

**Design Engineer - POWER Engineers, Inc.** PLS-CADD and PLS-Pole modeling for a 3 mile green line designed to 115 kV transmission line standards. Existing Lattice substation modeled in PLS-TOWER to analyze new loads applied and to determine members which required retrofit. Incorporation of client standards, as well as development of non-standard structures and hardware. Foundation design and drawing utilizing known field conditions and L-Pile software. Performance drawing development and coordination with steel pole vendor on their steel pole and anchor bolt cage design, as well as the switch manufacturer to verify allowable loading, attachment hardware and required dimensions. Coordination with drafting team to develop all required drawings. Assembly and submittal of IFC package to client. Construction and field support, as well as submittal of record package.

### Central Maine Power; Section 218 Rebuild; Maine, United States; 2009-2011

**Design Engineer - POWER Engineers, Inc.** PLS-CADD and PLS-Pole modeling for a 2 mile rebuild of existing 115 kV transmission line. Incorporation of client standards, as well as development of non-standard structures and hardware. Foundation design and drawing utilizing known field conditions and L-Pile software. Performance drawing development and coordination with steel pole vendor on their steel pole and anchor bolt cage design, as well as the switch manufacturer to verify allowable loading, attachment hardware and required dimensions. Coordination with drafting team to develop all required drawings. Assembly and submittal of IFC package to client. Construction and field support, as well as submittal of record package.

### Central Maine Power; Section 174; Maine, United States; 2008-2010

**Design Engineer - POWER Engineers, Inc.** PLS-CADD and PLS-Pole modeling for a 7 mile rebuild from existing 34.5 kV to 69 kV standards. Incorporation of client standards, as well as development of non-standard structures and hardware. Foundation design and drawing utilizing known field conditions and L-Pile software. Performance

drawing development and coordination with steel pole vendor on their steel pole and anchor bolt cage design to verify allowable loading, attachment hardware and required dimensions. Coordination with drafting team to develop all required drawings. Assembly and submittal of IFC package to client. Construction and field support, as well as submittal of record package.

**National Grid; New England East-West Solution (NEEWS);  
Massachusetts, United States; 2008-2010**

**Design Engineer - POWER Engineers, Inc.** Review of 345 kV steel pole and switch vendor submittals to verify drawings were in accordance with the provided performance drawings. Development and design of standard fiber assemblies for dead-end, suspension and running angle structures, as well as splice enclosures. Review of Plan & Profile drawings, structure assembly drawings, work lists and stringing charts prior to IFC submittal.

STATE OF MAINE  
DEPARTMENT OF ENVIRONMENTAL PROTECTION

and

STATE OF MAINE  
LAND USE PLANNING COMMISSION

IN THE MATTER OF

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
#L-27625-26-A-N/#L-27625-TG-B-N/ )  
#L-27625-2C-C-N/#L-27625-VP-D-N/ )  
#L-27625-IW-E-N )

CENTRAL MAINE POWER COMPANY )  
NEW ENGLAND CLEAN ENERGY CONNECT )  
SITE LAW CERTIFICATION SLC-9 )  
Beattie Twp, Merrill Strip Twp, Lowelltown Twp, )  
Skinner Twp, Appleton Twp, T5 R7 BKP WKR, )  
Hobbs town Twp, Bradstreet Twp, )  
Parlin Pond Twp, Johnson Mountain Twp, )  
West Forks Plt, Moxie Gore, )  
The Forks Plt, Bald Mountain Twp, Concord Twp )

PRE-FILED SUPPLEMENTAL TESTIMONY AND EXHIBITS OF  
GINO GIUMARRO

May 1, 2019

This testimony is in response to certain of the Environmental Questions in Appendix A of  
the Tenth Procedural Order.

**QUESTION 13: WHETHER TALLER POLES AND TRAVEL CORRIDORS COULD PROVIDE ENOUGH OF A LINK BETWEEN THE HABITAT ON BOTH SIDES OF THE CORRIDOR FOR SPECIES LIKE PINE MARTEN.**

This question assumes that pine marten may be used as a surrogate for other wildlife to generally understand the context of wildlife movement in the region. Considering that the pine marten has specific habitat and life history requirements, caution should be exercised in drawing particular conclusions about other species.

Nevertheless, and accepting that assumption for the purposes of answering Question 13, it is important to understand that this question is predicated on there being habitat on both sides of the corridor for species like pine marten. If there is not currently habitat on both sides of the corridor for species like pine marten, provisions for travel corridor links by installation of taller structures or other means would be of no benefit. The evidence I have reviewed demonstrates that “intermediate-age” and “mature” forest pine marten habitat is, at best, marginally and intermittently present along the 150-foot wide Segment 1 right of way (“ROW”) of the NECEC Project. Taller structure heights and travel corridors would not provide a link between habitat patches that are not directly proximal to the corridor.

*Focus Species Forestry, A Guide to Integrating Timber and Biodiversity Management in Maine* (“the Guide”),<sup>1</sup> provides a relevant means to evaluate habitat requirements of pine marten and thereby the potential benefit of providing a link across the Segment 1 ROW. The goal of the Guide is to “simplify the task of integrating timber management and conservation of biodiversity by identifying and managing for a few Focus Species,” of which American (pine) marten is

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<sup>1</sup> Maine Audubon 2007, Third Edition, attached hereto as Exhibit CMP-14-B.

identified as an “umbrella species.” An umbrella species is often used in the context of developing a wide range of management goals and objectives for large scale anthropogenic land changes such as commercial forestry operations. Pine marten is identified as an umbrella species “typically found in older forests” due to its large home range that covers 1 to 2 square miles (640 to 1,280 acres).

Table 1 of the Guide describes six forest ecosystems, including Northern Hardwoods and Spruce-Fir. Those latter two forest types are prevalent along the Segment 1 ROW and both are identified as “Focus Habitats” for pine marten. Beyond merely the forest type, however, the Guide also recognizes the critical role of “Stand Development Stage” which is the diameter, height, basal area, and age, of trees that Focus Species require in Focus Habitats.

Range, habitat, and management information for pine marten is concisely described on page 39 of the Guide. Intact patches at least 700 to 1,000 acres of “intermediate-age” and “mature” forest are identified as Focus Habitat for marten in both Northern Hardwood and Spruce-Fir forest ecosystems. In terms of extent, a landscape scale more than 60 to 70 percent of intermediate to old age classes is recommended for pine marten (Lambert et al., 2017).<sup>2</sup> Importantly, Stand Development Stages described in the Guide indicates that characteristics of such Focus Habitat for pine marten are associated with trees 30 to 100+ years old.

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<sup>2</sup> Lambert, J.D., Z.J. Curran and L.R. Reitsman, 2017. Guidelines for managing American marten habitat in New York and Northern New England. High Branch Conservation Service, Hartland, VT.



Examination of aerial photography indicates that most of the Segment 1 ROW has been cut for timber since 1984 (i.e., within the last 35 years). Commercial forestry land adjoining the ROW, if not clear-cut recently (within the last 10 years), has been cut within the last 15 to 35 years and is therefore in the “Regeneration and Seedling” stage preceding “Saplings and Small Structures” and would, at most, be of Intermediate-age and not Mature.

Accordingly, along each side of the proposed ROW, pine marten Focus Habitat is marginally present at best. In the future, with the continued use of this area as working forest, pine marten Focus Habitat also is unlikely to achieve a more advanced Developmental Stage. Consequently, taller structures and travel corridors would not provide a meaningful link between the habitat on both sides of the corridor for species like pine marten.

If such habitat were present, the scrub shrub habitat proposed for the Project ROW will provide sufficient linkage in the few circumstances where pine marten habitat is present on both sides of the ROW, without the need for taller structures or travel corridors.

Connecting suitable patches with a corridor is a well-established tool in natural resources management. *Wildlife Habitat Management of Forestlands, Rangelands, and Farmlands*<sup>3</sup> provides general guidelines for development and management of corridors. In the context of timber management, the authors describe the use of leave strips to connect habitats bisected by clear-cuts. Leave strips are the best travel lanes and consider the context of the connecting habitats. The authors state that these best travel corridors are often the areas of least topographic

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<sup>3</sup> Payne, N. F., Bryant, F. (1998). *Wildlife habitat management of forestlands, rangelands, and farmlands*. Malabar, Fla.: Krieger Pub. Co..

resistance, such as streams and riparian corridors, saddles, or cover areas in locations deficient in cover.<sup>4</sup>

Foresters and ecologists agree about the use of leave strips and other corridors to connect patches of habitat. However, there is no single standard for corridor length or width since a corridor's design is dependent on many specific factors. A corridor should be sufficiently wide so that the two edges differ, and so that the central portion has a distinct internal entity that is similar in structure, ecological communities, and species richness to the patches it is connecting.<sup>5</sup> In addition, the design aspects of the corridor's length, curvilinearity, alignment, and relative position to connecting patches must be analyzed to determine its effectiveness.<sup>6</sup> These factors are important because corridors have five main functions in landscapes: habitat, conduit, filter, source, and sink. Each of these factors should be considered in corridor design.<sup>7</sup> Therefore, good corridors for wildlife are specifically and deliberately designed; there is no set standard for width, length, shape, or vertical structure.

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<sup>4</sup> Thomas, J. Ward., Parker, J. Louise., Wildlife Management Institute., Pacific Northwest Forest and Range Experiment Station (Portland, O. Information Services., Pacific Northwest Forest and Range Experiment Station (Portland, O., United States. Bureau of Land Management., United States. Forest Service. (1979). Wildlife habitats in managed forests: the Blue Mountains of Oregon and Washington. Washington, D.C.: Wildlife Management Institute.

<sup>5</sup> Forman, Richard T., 1995, Land Mosaics: the ecology of landscapes and regions: Land Mosaics: the ecology of landscapes and regions. Cambridge: Cambridge University Press, 1995.

<sup>6</sup> *Id.*

<sup>7</sup> *Id.*

Feathering of vegetation is used along powerline corridors to ease the transition between ecotones and thereby reduce edge effect.<sup>8</sup> Where possible, these should be located in natural funnels where wildlife would be normally funneled by small peninsulas of land which channel animals to the corridor<sup>9</sup>. These funnels exist in the landscape along stream, wetland, and riparian areas. CMP has agreed to feathering several areas of the ROW along riparian areas and deer wintering areas (DWAs). CMP also has committed to maintaining 100-foot riparian buffers along all coldwater fishery streams, outstanding river segments, waterbodies containing rare, threatened or endangered species, and all perennial streams in Segment 1 of the Project. In these cases, the buffers will act as wildlife travel corridors that preserve the connectivity of the areas that are most likely acting as current corridors for many species of wildlife. In some cases, this would include connecting habitat of the pine marten.

The factors I have described are of primary importance in considering connectivity of forested habitat that would meet the requirements of a pine marten species umbrella. Increasing structure height would be of limited value since vegetation height would not be the limiting factor in the effectiveness of these wildlife travel corridors. The modest gain of vegetation height from increasing structure height would not substantively increase wildlife movement in these

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<sup>8</sup> Gates, J. E. 1991. Powerline Corridors, Edge Effects, and Wildlife in Forested Landscapes of the Central Appalachians. Pages 12-32 in J. E. Rodiek, and E. G. Bolen, eds. Wildlife and habitats in managed landscapes. Island Press, Washington, D. C.

<sup>9</sup> Forman, R. T. T. 1987. Emerging directions in landscape ecology and applications in natural resource management. In R. Herrmann and T. Bostedt-Craig, eds., Proceedings of the conference on science in the national parks. U.S. National Park Service and the George Wright Society: Fort Collins, Colorado, pp. 59–88. as cited in Payne, N. F., Bryant, F. (1998). Wildlife habitat management of forestlands, rangelands, and farmlands. Malabar, Fla.: Krieger Pub. Co..

areas. Further, and again even if pine marten Focus Habitat were present, travel corridors such as those CMP has proposed for the Upper Kennebec Deer Wintering Area would provide sufficient linkage, without the need for taller structures and full height vegetation.

**QUESTION 14: IN TNC’S NINE AREAS OF CONCERN, WHETHER TRAVEL CORRIDORS MUST BE LOCATED WITHIN A CERTAIN DISTANCE OF STRUCTURES (POLES), AND WHAT THE MINIMUM WIDTH WOULD BE OF THE TRAVEL CORRIDORS IN ORDER FOR SPECIES LIKE THE PINE MARTEN TO USE THEM.**

This question must be considered in the context of the overall forest matrix. This matrix is defined by three attributes: area, connectivity, and control over dynamics.<sup>10</sup> The area of the forested matrix in this part of Maine can be difficult to describe because the region is continuously shifting cover types, because of rotational forest harvest. The nature of this shifting mosaic is what dominates the area of the forest matrix. In this system, we are interested in understanding connectivity to the extent that it controls ecosystem dynamics. Understanding what makes up the forest matrix is important to understand the implications of matrix dynamics and, therefore, the landscape resistance that describes the effectiveness of a corridor.<sup>11</sup> How much “stuff” (wildlife in this case) and the rate by which the corridor helps or hinders this flow is widely influenced by the form and function of what is around it.

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<sup>10</sup> Forman, Richard T., 1995, Land Mosaics: the ecology of landscapes and regions: Land Mosaics: the ecology of landscapes and regions. Cambridge: Cambridge University Press, 1995.

<sup>11</sup> *Id.*

To determine appropriate travel corridor width for species like pine marten and the related proximity to structures requires an evaluation of each of the nine locations identified by TNC, as summarized in the following table.

| <b>TNC Location</b> | <b>Length (miles)</b> | <b>Township</b>                           | <b>1/30/2019 NRM Map Page #s</b> | <b>Structures</b> | <b>Riparian Stream Corridors</b>                                                       | <b>Focus Habitat, Stand Development Stage Condition</b>                                                                                             |
|---------------------|-----------------------|-------------------------------------------|----------------------------------|-------------------|----------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------|
| 1                   | 1.63                  | Beattie                                   | 8-11                             | 795 to 803        | Number 1 Brook                                                                         | Cut after 5/1988 & before 5/2004 Abuts and within 2,800 ft of Lowelltown Road.                                                                      |
| 2                   | 1.39                  | Skinner                                   | 21-22                            | 765 to 771        | South Branch Moose River                                                               | Cut after 5/1988 & before 5/2004 Bounded by logging road and crossed by or within 1,800 ft of West Branch and Beaudry Roads.                        |
| 3                   | 1.23                  | Skinner, Appleton                         | 26-28                            | 752 to 758        | 3 unnamed perennial streams with associated intermittent tributaries                   | Cut after 5/1988 & before 5/2004 Within 1,800 ft Pine Tree Rd and bounded on east by a logging road.                                                |
| 4                   | 3.15                  | Appleton                                  | 32-39                            | 725 to 743        | Gold Brook and tributaries, perennial streams flowing in Rock and Iron Ponds           | Cut after 6/1997 & before 5/2004 & subsequently before 8/2011. Adjacent to, crossed 3 times, and within 1,800 ft of Spencer Road.                   |
| 5                   | 4.22                  | Hobbs town TR7 BKP WKR, Bradstreet        | 46-57                            | 683 to 704        | Toby Pond inlet, Whipple Brook, Bitter Brook, Moose River tributary and Egg Pond inlet | Cut after 6/1997 & before 5/2004 Bounded by Tobey Rd and within 8,000 ft of Spencer Road.                                                           |
| 6                   | 2.45                  | Bradstreet, Parlin Pond, Johnson Mountain | 66-71                            | 649 to 656        | Perlin Brook and 2 other perennial streams                                             | Cut multiple times after 6/1997; most recently between 9/2007 and 8/2011. Bounded, within 2,000 ft, and crossed 3 times by Mining or Spencer Roads. |
| 7                   | 0.72                  | Johnson Mountain                          | 75                               | 639 to 643        | Not crossed by perennial stream                                                        | Crossed twice and within 500 ft of logging roads.                                                                                                   |
| 8                   | 3.71                  | Johnson Mountain, West Forks              | 79-84                            | 564 to 585        | Tomhegan Stream and 3 perennial tributaries                                            | Crossed by a transmission line and crossed by or within 11,000 ft of Wilson Road.                                                                   |
| 9                   | 3.68                  | West Forks                                | 87-91                            | 540 to 554        | Kennebec River, Moxie Stream                                                           | Crossed 3 times by and within 500 ft of Fish Pond Rd.                                                                                               |



This table presents attributes identified by Bissonette et al. (1991)<sup>12</sup> as the key elements for landscape level management of marten: 1) old growth should be the matrix (prevailing) element in the landscape, and 2) corridor access routes between patches are preferably maintained along riparian corridors. Accordingly, the table shows Stand Development Stage as well as the occurrence and abundance of persistent, natural features (stream riparian corridors) and established disturbance (roads) in the nine TNC locations.

As discussed in response to the prior question, and as the chart above demonstrates, there are few old growth forest ecosystems along the 150-foot-wide Segment 1 ROW. Notwithstanding that fact, which renders taller structures and travel corridors largely futile for the travel of pine marten, I analyzed the remaining factors of riparian corridors and proximity to daily active roads to identify where travel corridors for species like marten are best located in relation to placement of taller structures. This approach is consistent with TNC findings for barrier analysis-based, cost-effective establishment of functional travel corridors (McRae et al., 2012).<sup>13</sup> Riparian ecosystems are also recognized for biological productivity and diversity, and often important habitat links (Pelletier, 2008).<sup>14</sup>

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<sup>12</sup> Bissonette, J., R.J. Fredrickson and B. J. Tucker, 1991. American Marten: A Case for Landscape-level Management, *in* Wildlife and Habitats in Managed Landscapes, J.E. Rodiek and E. G. Bolen eds, pgs 114-134.

<sup>13</sup> McRae, B.H., S.A. Hall, P. Bier, and D.M. Theobald, 2012. Where to Restore Ecological Connectivity? Barrier and Quantifying Restoration Benefits, PLOS One, V 7, Is 12, 12 pgs.

<sup>14</sup> Pelletier, S.K., 2008 ed. Forest Management Issues: Habitat Connectivity, *in* Biodiversity in the Forests of Maine: Guidelines for Land Management, C. A. Eliot ed., pgs. 111 – 115.

Conditions along the nine TNC locations are displayed on CMP's January 30, 2019 natural resource maps in the NECEC permit application. These maps display the timber harvest extent and Stand Development Stage relevant to pine marten Focus Habitat within approximately 900 feet of the centerline for a 0.5-mile length of Segment 1,<sup>15</sup> and thus can identify areas in the nine TNC locations that are best suited for travel corridors created by an increase in structure height. From this determination and with engineering analysis of conductor clearance requirements, the minimum width of the resultant spanned travel corridors can be determined.

As described in response to Question 13, there is no broadly agreed upon standard for corridor width. However, in practice within Maine and agreed to as part of CMP's mitigation, a 100-foot buffer along many streams (75-foot buffer along the remainder of streams) has been proposed to minimize and mitigate potential impacts. These 200-foot, or more, wide buffers have been agreed to by the MDIFW and CMP after careful consideration regarding protecting these resources. When used in an area that would connect existing patches, a 200-foot corridor should also be suitable to facilitate travel of marten and the associated assemblage of species under its umbrella. Again, some of these stream and riparian crossings may connect pine marten habitat.

Therefore, a specific distance from a structure for travel corridors would be an arbitrary measure, because it is not a part of the equation for good wildlife corridor design. Corridor width should look and feel like those in the landscape and should connect patches of habitat. It is my

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<sup>15</sup> It should be noted, however, that these maps are more than three years old, and thus do not display subsequent timber harvesting nor indicate the location or extent of future timber harvests.

opinion that the treatments described in CMP's mitigation plan are a reasonable width to facilitate wildlife movement in many areas.

**QUESTION 15: IN TNC'S NINE AREAS OF CONCERN, WHETHER TAPERING WOULD ADEQUATELY REDUCE THE FOREST FRAGMENTATION OF ANY CLEARING.**

The question assumes that the scrub shrub cover to be maintained along the 150-foot-wide Segment 1 ROW is a source or cause of fragmentation in the area, and that "tapering" of the associated edges is an effective means to mitigate this effect. The managed scrub shrub habitat associated with transmission corridor ROWs are only one type of fragmentation. The region is highly fragmented by clear-cuts, strip cuts, skid trails, log yards, logging roads, and snowmobile/recreational trails. Each of these fragmenting features has the potential to create habitat for some species while creating inhospitable conditions for others.

Much of the proposed ROW is bordered by immature and early successional forest types caused by recent fragmenting forestry activities (as described in my responses to Question 13 and Question 14). The area surrounding the Project is a shifting mosaic of habitats found from the variety of land uses and commercial forest management practices in the region, and there is very little or no old growth forest along the 150-foot-wide Segment 1 ROW. These forests are managed for a wide variety of goals and in accordance with changes in soil type, elevation, depth to bedrock, and other biotic and abiotic factors.

Consequently, the maintained Project ROW is structurally similar to much of the forest matrix, and the consequences of any fragmentation from the scrub-shrub ROW are minimal. Indeed, when mature forest is the management objective (i.e., managing mature forest for

biodiversity and wildlife habitat), roads and power lines are responsible for dissection. More extensive clearing, such as clear-cuts, fields, and residential development, are responsible for isolation, reduction of patch size, and increasing fragmentation.<sup>16</sup>

In the response to Question 13, I describe how natural resources managers have used leave strips in clear-cuts in places where the best corridors should be located. It is a thoughtful and deliberate process that relies on developing an understanding of the five factors used in designing corridors. Tapering or feathering of vegetation is one of the tools land managers can use to improve the functions of corridors by providing *habitat* in the ROW. Natural funneling can improve *conduit* function if located along naturally occurring landforms (e.g., peninsulas of habitat, streams, rivers, ridges, saddles, etc.). The permeability of the *filter* effect can be increased by providing wildlife with the option of crossing at a place where the habitat is more similar to the surrounding matrix (where habitat is present on both sides of the ROW). Tapering will also change the functional dynamics of *source* and *sink* along the ROW. For some species these tapered areas might be a source of recruitment, while for many prey species these same tapered areas might act as a sink.

If TNC's nine areas of concern represented mature forest in areas that would be consistently maintained in a mature state for the life of the Project, then there could be a benefit from tapering to minimize the effects of habitat. CMP identified many of these same areas as part of their Compensation Plan for the Project; this Plan appears to have been thoughtful and

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<sup>16</sup> Flatebo, G., and C.R. Foss, 2008 ed. Forest Management Issues: Habitat Patch Size, *in* Biodiversity in the Forests of Maine: Guidelines for Land Management, C. A. Eliot ed., pgs. 105 – 110.

deliberate in considering and proposing measures to connect adjacent habitats, such as winter deer travel corridors within the upper Kennebec deer wintering area. The tapering described and proposed in CMP's Compensation Plan within many of TNC's 9 areas of interest, combined with tapering at select perennial stream and riparian areas, appropriately and adequately addresses habitat fragmentation concerns within the matrix of the Project.

#### Exhibits

CMP-14-A: Giumarro CV

CMP-14-B: Focus Species Forestry, A Guide to Integrating Timber and Biodiversity Management in Maine




Dated: 4/30/19

Respectfully submitted,

  
Gino GiumarroSTATE OF MAINE  
Cumberland, ss.

The above-named Gino Giumarro did personally appear before me and made oath as to the truth of the foregoing pre-filed testimony.

Before,

Dated: 4/30/19  
Notary Public  
Name: Cindy Brouwer  
My Commission Expires: 12/12/23CINDY BROUWER  
Notary Public, Maine  
My Commission Expires December 12/12/23



## GINO GIUMARRO

### CERTIFIED WILDLIFE BIOLOGIST - BUSINESS UNIT DIRECTOR

#### *YEARS OF EXPERIENCE*

- 25

#### *EDUCATION*

- M.S., Natural Resources Planning, University of Vermont, 2000
- B.S., Wildlife Biology, University of Massachusetts, 1995

#### *AREAS OF EXPERTISE*

- Project management
- FERC licensing
- NEPA compliance
- Ecological impact assessments for energy projects
- Routing and siting
- Rare, threatened and endangered species surveys
- Federal, state and local permitting

#### *SPECIAL TRAINING*

- U.S. Army Public Health Center Environmental Noise Evaluation Training
- Incident Command System - Planning Leader Training

#### *CERTIFICATION*

- Certified Wildlife Biologist
- FAA Qualified Airport Biologist

#### EXPERIENCE SUMMARY

Mr. Giumarro is a Certified Wildlife Biologist with more than 25 years of experience conducting natural resources investigations and permitting in the energy, government, transportation, and commercial markets. He has led multidisciplinary teams for linear project routing, siting, assessment, and associated permitting. Mr. Giumarro was an early developer of bird and bat survey protocols for wind power assessments and in conducting wind siting assessments across the country. In addition, he has led the environmental services efforts for some of the largest pipelines and natural gas gathering systems in the country. He has specialized expertise with bird and bat surveys, with a focus on rare species surveys and consultations under the Endangered Species Act. Mr. Giumarro currently leads the POWER Engineers nationwide Biology Business Unit.

Mr. Giumarro specializes in Federal Energy Regulatory Commission (FERC) license applications, ecological community characterizations, biological assessments, Endangered Species Act Section 7 consultations, Clean Water Act permitting, and document preparation in accordance with the National Environmental Policy Act (NEPA). He has also provided emergency ecological response services at several significant oil spills across North America, and acted as a quality control lead for a multinational environmental services practice.

The following are representative projects conducted in Maine and across the country.

#### **Ranger Solar, Commercial Generation Program, Multiple States**

Biologist responsible for vernal pool surveys, RTE species surveys, and wetland delineations for five proposed Ranger Solar, LLC projects in Maine, New Hampshire, and Connecticut. Collectively, the projects span thousands of acres and required avoidance and minimization measures that maximized panel placement. Ranger has proposed to develop utility-scale commercial solar power generating facilities that would generate clean energy to be transmitted through the region's electric grid. The projects were included in Ranger Solar's successful bid in the New England Clean Energy RFP. These surveys collected information on the location, size, and quality of resources and were used to develop permitting thresholds and rare species mitigation plans

#### **Patriot Towers – Statewide Ecological Suitability Assessment**

Gino worked with agencies such as the Maine Natural Areas Program, Maine Department of Inland Fisheries and Wildlife (MDIFW), and U.S. Fish and Wildlife Service (USFWS) to help evaluate protected wildlife and flora and fauna species and critical habitat at or adjacent to the 60 sites across the forested landscape. This work was initiated through a landscape analysis whereby the landscape position of each site was evaluated in conjunction with various GIS datasets. Comparing information such as soils, hydrology, elevation, land cover, and vegetation cover allowed for the creation of a

#### EMPLOYMENT HISTORY

- **POWER Engineers (2017-present)**  
Business Unit Director – Ecology
- **Verdanterra, LLC (2014-present)**  
Director of Ecological Services
- **Stantec (2008-2014)**  
Principal
- **Woodlot Alternatives (2003-2008)**  
Director of Ecological Services  
Senior Project Manager
- **engineering-environmental Management (now HDR; 2000-2003)**  
Wildlife Biologist  
Project Manager
- **Maine Audubon Society (1998)**  
Wildlife Biologist
- **Chewonki Foundation (1996-1997)**  
Naturalist
- **Trustees of Reservations (1995-1996)**  
Wildlife Biologist

#### ADDITIONAL REPRESENTATIVE PROJECTS

- Deepwater Horizon – Natural Resource Advisor (Mobile Command Center)
- Wind Farm Development Surveys and Risk Assessments (New York, New Hampshire, Vermont, Maine, Virginia, West Virginia, and Pennsylvania)
- EdgeMarc Energy Rare Bat Surveys (Ohio)
- Equitrans TP-371 Migratory Bird Assessment (Pennsylvania)
- National Park Service Trenton Intermodal Facility Planning (Maine)
- Department of Defense INRMPs (multiple nationwide)
- Blue Racer Midstream Gas Gathering Project (Ohio)
- Access Midstream Rare Bat Surveys (Ohio)
- National Park Service Cape Cod NS Hunting EIS (Massachusetts)
- Mount Rushmore National Memorial Air Tour Management Plan Environmental Assessment (South Dakota)

biophysical profile that aids in the determination of the likelihood rare species presence. This process is not meant to replace field surveys in any way, but instead helps to focus field efforts on those areas with the greatest likelihood of species presence. Gino surveyed each area mountaintop site to determine the presence or absence of critical habitats and any state or federally-listed RTE species. The field surveys will consist of line and loop transects that focus on areas with the highest potential for rare species or communities to be present.

#### **Riverbank Energy Center, Wiscasset Maine**

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Gino aided in the determination that this project would have an unprecedented impact to zooplankton and other marine organisms within Montsweag Bay and the Sheepscot River and ultimately convinced the developer to find other places to develop their concept. The project was a 1,000-megawatt (“MW”) pumped storage hydroelectric Project located in Wiscasset, Maine. The principal project works included an upstream reservoir (the Back River), and an underground downstream reservoir located 164 feet above the distributor centerline elevation with a water fluctuation of 130 feet and a capacity of 1.23 billion gallons. The downstream reservoir is composed of six (6) large unlined caverns, 90 feet wide by 156 feet high, and 1,874 feet below ground.

#### **Kinder Morgan, Utica Marcellus Texas Pipeline, Multiple States**

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Principal Scientist tasked with development and implementation of multi-state permitting and environmental consultation, as well as oversight of natural resources assessment along the pipeline corridor. The Utica Marcellus Texas Pipeline (UMTP) project is designed to transport purity and mixed natural gas liquids produced from the Utica and Marcellus areas to the Gulf Coast. The pipeline will provide connectivity to major processing and fractionation hubs in the basin. The proposed project involves the abandonment and conversion of nearly 1,000 miles of natural gas service on the Tennessee Gas Pipeline, the construction of approximately 200 miles of new pipeline from Louisiana to Texas, and new storage capacity and laterals in Ohio.

#### **Spectra Energy NexusGas Transmission Project, Multiple States**

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Principal Manager who managed wetland and waterbody surveys and delineations on an approximately 250-mile proposed pipeline corridor crossing portions of Ohio and Michigan. Daily data collection and reporting included U.S. Army Corps of Engineers wetland data forms, Ohio Rapid Assessment Method (ORAM), stream corridor assessments (HHEI/QHEI), and GPS survey within the proposed pipeline right-of-way.

#### **Multiple Clients, Natural Resource Services, Multiple States**

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As Senior Ecologist and Project Manager, conducted a reconnaissance assessment and survey of terrestrial and aquatic systems at numerous project sites throughout New England to identify and characterize suitable habitat conditions for a variety of RTE species, rare or exemplary natural resources, wetland resources, potential vernal pools, and natural communities. Determinations of applicability were provided to clients to assist with their project planning and permit applications in compliance with applicable local, state, and federal natural resource regulations.

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**NASA, Wallops Island Flight Facility Bat Evaluation, Virginia**

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Conducted bat acoustical surveys during the fall migration period. Bat acoustic data was used to characterize bat presence in the project area and allow for some identification of bat species or guilds. The data provided an index of bat activity between migration and breeding periods and will help determine whether seasonality affects bat activity.

Echolocation calls were identified to the species level whenever possible. Bat calls were identified to guild, although some calls were provisionally categorized to species when possible. Mr. Giumarro reviewed regional databases of bat calls to aid in the interpretation of results through use of filtering software.

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**Downeast LNG, Downeast LNG Import/Export Terminal and Pipeline, Maine**

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Led the environmental and permitting program for construction of a potential liquefied natural gas (LNG) import terminal and natural gas pipeline in eastern Maine. The project included a 47-acre port facility and a 30-mile natural gas pipeline. The proposed development included an associated pier facility extending approximately 3,300 feet from shore into Passamaquoddy Bay.

Mr. Giumarro directed field work and was the primary author of permitting documentation, FERC application materials, and Biological Assessments. Directed the site prospecting and selection process. Assisted the client in evaluating environmental resources and potential impacts, preparing FERC documentation. Served as a liaison with natural resource agencies, and coordinated state and local environmental permitting for the project.

Mr. Giumarro also conducted an extensive site characterization, including detailed marine and terrestrial habitat surveys, rare species studies, wetland mapping and functional assessments, essential fish habitat studies, marine mammal habitat evaluations, development of potential gas pipeline corridors, and reviews of regulatory requirements for state and federal environmental permitting. Mr. Giumarro also conducted detailed wetland and RTE species field evaluations along the pipeline corridor alternatives. Directed the preparation of Biological Assessments for Atlantic Salmon, bald eagles, and marine mammals with the USFWS and National Marine Fisheries Service (NMFS).

# American Marten

**Distribution:** Alaska to Newfoundland, south to Nevada, New Mexico, northern Minnesota, northern New York, and northern Maine

**Maine Focus Region:** North

**Home Range:** Average 1 sq. mi. for females, 2 sq. mi. for males (640-1,280 acres)

**Food:** Primarily small mammals including voles, mice, red squirrels; also grouse, hare, bird eggs, fruits, berries, and nuts



**Special Habitat Needs:** Extensive mature hardwood, mixed-wood, or conifer forests with abundant snags and downed trees and other structural features **2= 2,500 ac and 7=8,750 ac**

where max Twp ROW is 230.52 ac or 2.6 to 9.2% of M hab or 0.9%Twp area

## Management:

- ✓ Maintain an average of 7 marten habitat units (no less than 2) per township that are:
  - **>1,250 acres, with**
    - 75% of stands >40 ft. tall with basal area >80 sq. ft./acre, and **? any particular dbh?**
    - include at least one large, intact patch of 700-1,000 acres that meets the height and density requirements above.
- ✓ Maintain dead trees, logs, root mounds, and other structural features as denning sites and cover for small mammals that are the marten's staple diet. See snag and cavity tree guidelines (Section 7).
- ✓ Use even-aged or uneven-aged management, as long as basal area, height, and snag/deadwood goals are met. Regeneration using a shelterwood-with-reserves system in conifer and mixed stands will promote softwood regeneration and prey, especially snowshoe hare, while maintaining canopy cover.
- ✓ Restrict access during trapping season.

**Comments:** Commonly called the pine marten in Maine. Extensive research at the University of Maine suggests that management for marten will provide habitat used by most northern forest species, except those that require very young or late-successional forest conditions. Marten are easily trapped, so where road densities are high, access should be restricted during trapping season to enhance survival

## Habitat Use:

| Forest Ecosystems |   |   |   |                    |   |   |   |   |          |   |   |   |   |         |   |   |            |   |   |   | Special-value Habitats |                |   |   |                         |             |
|-------------------|---|---|---|--------------------|---|---|---|---|----------|---|---|---|---|---------|---|---|------------|---|---|---|------------------------|----------------|---|---|-------------------------|-------------|
| Aspen-Birch       |   |   |   | Northern Hardwoods |   |   |   |   | Oak-Pine |   |   |   |   | Hemlock |   |   | Spruce-Fir |   |   |   |                        | N. White Cedar |   |   | Riparian/Wetland Forest | Vernal Pool |
| R                 | S | I | M | R                  | S | I | M | L | R        | S | I | M | L | I       | M | L | R          | S | I | M | L                      | I              | M | L |                         |             |
|                   |   |   |   |                    |   |   |   |   |          |   |   |   |   |         |   |   |            |   |   |   |                        |                |   |   |                         |             |

R Regeneration and seedlings    Mx Mixed conifer-deciduous  
 S Saplings and small poles    U Understory present  
 I Intermediate-aged forest    C Cavity tree or snag  
 M Mature forest  
 L Late-successional forest

Focus habitat  
 Other habitat  
 Little/no use

**References:** Boone and Krohn 1998, Burt 1976, Chapin et al. 1998, DeGraaf and Yamasaki 2001, Fuller and Harrison 2000, Harrison 2004, Payer and Harrison 2003, Payer and Harrison 2000a, Payer and Harrison 2000b



**Table 2. Stand Development Stages**

| Stand Development Stage |                            | Identification                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|-------------------------|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                         |                            | Typical characteristics <sup>1</sup>                                                                                                                                                                                                                                                                                                                                                                                        | Description                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| Early Successional      | Regeneration and Seedlings | Less than 30 sq.ft. basal area/ac. (BA) in trees >1 in. dbh.<br>Typically 0-10 years                                                                                                                                                                                                                                                                                                                                        | Regeneration phase; may include partial residual overstory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
|                         | Saplings and Small Poles   | BA in trees 1-5 in. dbh greater than that of trees <1 in. or >5 in.<br><del>Typically 10-30 years old</del>                                                                                                                                                                                                                                                                                                                 | Young, closed-canopy stands or two-storied stands dominated by small trees with a partial residual overstory                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| Intermediate            |                            | Majority of stocking in: <ul style="list-style-type: none"> <li>• Softwood stands: &gt;5 in.</li> <li>• Hardwood stands &gt;5 in.</li> </ul> <del>Majority of stocking typically in trees 30-70 years old</del>                                                                                                                                                                                                             | Includes even-aged stem-exclusion stands (little or no understory) and two-story stands with partial overstory of mature trees                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
| Mature                  |                            | Majority of stocking in: <ul style="list-style-type: none"> <li>• Spruce-fir &gt;9 in.</li> <li>• Hardwoods &gt;12 in.</li> <li>• Pine-hemlock &gt;12 in.</li> </ul> Overstory typically 70-100+ years depending on forest type                                                                                                                                                                                             | Includes stands dominated by small- to large-sized sawtimber, including stands in the late stem exclusion stage and early phases of understory reinitiation. May be single story, two story, or multi story depending on past harvest history. Depending on species and condition, may be maintained by individual tree or group-selection harvests.                                                                                                                                                                                                                                                                      |
| Late-Successional       |                            | Majority of stocking (better site quality, will vary with species, site, and stand history): <ul style="list-style-type: none"> <li>• Spruce-fir ≥12 in.</li> <li>• Hardwoods ≥16 in.</li> <li>• Pine-hemlock ≥20 in.</li> <li>• Large deadwood accumulating</li> <li>• Indicator species (e.g., certain lichens) present</li> </ul> Transition from mature to late successional is generally in the 100-125-year age range | Net growth stable or declining in unharvested stands; principle mortality in canopy due to disease, wind, and insects. Large-diameter dead wood accumulating in standing trees and on the ground. Typically one or more age classes represented in the understory or in gaps but may be virtually even-aged in the case of pine and hemlock. When long-lived species with medium to high shade tolerance are present, this stage can be maintained over time by light individual-tree or group-selection management. Stands meeting diameter guidelines but lacking other characteristics should be classified at mature. |
| Old-Growth              |                            | Generally >150 years old                                                                                                                                                                                                                                                                                                                                                                                                    | Old growth is the culmination of the late-successional stage. These stands are typically unharvested or have a very light harvest history.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |

<sup>1</sup> Diameters and ages are general guidelines only and will vary based on site characteristics, stand history, and forest type. Note that diameter guidelines are overlapping; place stand in the oldest development stage possible given the diameter constraints and other characteristics. Final determination should be based on professional judgment based on stand conditions and knowledge of local forests. See Appendix 10 for example of stand classification.

# Northern Hardwoods

## Identification

Sugar maple, yellow birch, and American beech are the characteristic species. Paper birch, aspen, red oak, hemlock, and red spruce are common associates. On poor sites beech and red maple may be dominant, while sugar maple, ash, and basswood are found on highly enriched sites. Stands range from pure hardwood to mixed hardwood-conifer. This type is known for an abundance of spring wildflowers.

## Ecology

Northern hardwood forests are typically found on moist, medium- to well-drained sites at middle elevations in western, northern, and eastern Maine. Over time this late-successional type forms large, relatively stable forests. Under natural conditions, shade-tolerant northern hardwoods are most commonly regenerated in small gaps created by windthrow or mortality due to insects and disease. There is often a transition to spruce-fir at high elevations. Mixed hardwood-conifer stands are common on sites with intermediate site quality at lower elevations.

## Wildlife

Northern hardwoods host a great variety of resident and migrant songbirds that are uniquely adapted to different ages of forest as well as different positions (ground, understory, or canopy) within the forest. Beech nuts are critical to reproductive success of black bear in northern Maine. Because of their extent—about 6 million acres in Maine—northern hardwoods are one of Maine's most important forest habitats.



### Rare Species

17 rare plants are associated with this ecosystem, most frequently in enriched hardwoods

### Rare Natural Communities

Maple-basswood-ash forest (also known as enriched hardwood forest)

| Focus Species                                                         |                                                                                                                                                                                                     |                                               |
|-----------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------|
| Early Successional Forest                                             | Mature Forest                                                                                                                                                                                       | Late-successional Forest                      |
| Chestnut-sided warbler<br>Snowshoe hare <sup>1</sup><br>Ruffed grouse | Fisher (South region)<br>American marten (North region)<br>Northern goshawk<br>Pileated woodpecker<br>Barred owl<br>Wood thrush (South region)<br>Black-throated-blue warbler<br>Redback salamander | Lungwort lichen ( <i>Lobaria pulmonaria</i> ) |

<sup>1</sup>conifer understory present

| Focus Species Management |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|--------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Overview                 | Northern hardwoods are <u>adaptable to a wide range</u> of silvicultural practices. The natural community characteristics of northern hardwoods are best maintained by single-tree or group selection cutting, while heavier cuts may be used for specific timber and wildlife objectives.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
| Single Tree Selection    | <ul style="list-style-type: none"> <li>✓ Well suited to maintaining mature forest and consistent with natural disturbance patterns.</li> <li>✓ May be used with caution in maple-basswood-ash forest (a rare natural community)—avoid soil disturbance and maintain &gt;60% overstory canopy closure.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |
| Group Selection          | <ul style="list-style-type: none"> <li>✓ Use to maintain mature forest while encouraging mid-tolerant species like yellow birch and ash and creating small patches (up to 2 acres) of early successional habitat.</li> </ul>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| Shelterwood and Clearcut | <ul style="list-style-type: none"> <li>✓ Use to create patches of <u>early successional habitat over 2 acres in size</u> and to regenerate intolerant species or low-quality stands.</li> <li>✓ Retain patches of mature stands in islands or peninsulas as well as travel corridors. See stand-level guidelines for details (Section 7).</li> <li>✓ <u>Return tree tops to the harvest area</u> to prevent nutrient depletion and maintain soil structure.</li> <li>✓ Shelterwood harvests can be used to emulate extreme natural disturbances; lengthening the period before overstory removal will minimize impacts to herbaceous plants.</li> <li>✓ <u>Clearcuts have no true natural analogue</u> and require a longer time for ecosystem recovery.</li> <li>✓ When clearcuts and shelterwood are used, long rotations (&gt;100 years) may be necessary to restore mature forest conditions.</li> </ul> |
| Other                    | <ul style="list-style-type: none"> <li>✓ Maintain nut-producing oak and beech. Where healthy beech are not present, even trees with partial live crowns are beneficial to bears and other wildlife.</li> <li>✓ Maintain inclusions of hemlock, spruce, and other conifers.</li> <li>✓ Follow recommendations for snags, cavity trees, and downed woody material and other stand-level guidelines (Section 7).</li> <li>✓ Refer to landscape-level guidelines for recommendations on integrating landscape structure and design into stand level-decisions (Section 8).</li> </ul>                                                                                                                                                                                                                                                                                                                            |

**Mixed Northern Hardwood-Spruce-Fir Forests:** In general, for mixedwood stands up to 1/3 spruce-fir and other softwoods, use the northern hardwood recommendations; for mixedwood stands with 1/3 to 2/3 in conifers, consider both the northern hardwood and spruce-fir recommendations; for mixedwood with more than 2/3 in conifers, use the spruce-fir recommendations.

**References:** Carlson 1999 (see Section II, Enriched Hardwood Forests), DeGraaf et al. 1992, DeGraaf and Yamasaki 2001, Flatebo et al. 1999, Eyre 1980, Leak et al. 1987, MNAP 2001, Seymour 1984, Solomon et al. 1995



# Spruce-Fir

## Identification

Spruce-fir forests are typically characterized by mixtures of red spruce or white spruce and balsam fir in pure stands or with other species. Common associates include yellow birch, paper birch, and other northern hardwood species as well as hemlock, northern white cedar, and black spruce. White pine in the spruce-fir/northern hardwood landscapes of northern or eastern Maine is included in the spruce-fir ecosystem for the purposes of Focus Species Forestry.

## Ecology

Spruce-fir forests frequently share the same landscape as northern hardwoods, but are found on cooler sites—notably valley bottoms and high-elevation areas, and in a narrow band along the coast—or where soils are somewhat-poorly to poorly drained. Transitional stands may contain up to 50% hardwoods. The Maine Natural Areas Program recognizes 6 spruce-fir subtypes (see Appendix B). Stands dominated by white spruce are common on former agricultural land in northern and eastern Maine as well as in the spray zone on coastal islands.

## Wildlife

Several species—including spruce grouse, gray jay, black-backed woodpecker, and bay-breasted, magnolia and Cape May warblers—are found almost exclusively in spruce-fir forests. Marten are strongly associated with this type, either in pure stands or in mixed hardwood-spruce-fir forests. Young spruce-fir is critical for snowshoe hare. Relatively mature to mature stands are critical deer wintering areas in northern Maine.



### Rare Species

Canada lynx  
Bicknell's thrush (limited to fir-heartleaved birch subalpine forest)  
9 rare plants

### Rare Natural Communities

Fir-heartleaved birch subalpine forest

| Focus Species                     |                                                                                                                                              |                                                     |
|-----------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------|
| Early Successional Forest         | Mature Forest                                                                                                                                | Late-successional Forest                            |
| Snowshoe hare<br>Magnolia warbler | American marten (North region)<br>Fisher (South Region)<br>White-tailed deer (North region)<br>Black-backed woodpecker<br>Redback salamander | Gray horsehair lichen ( <i>Bryoria capillaris</i> ) |

| Focus Species Management                     |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
|----------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Overview</b>                              | Under natural conditions, disturbances that lead to regeneration vary by site and location. Spruce budworm and spruce bark beetle cause severe mortality on a cyclical basis, and blowdowns are not uncommon on coastal islands, high-elevation sites, and exposed sites with a high water table. Large stand-replacing disturbances may occur, but partial canopy loss in small to large patches is more common. On sites with a northern hardwood or hemlock component, regeneration is more likely to occur in smaller canopy gaps. Disturbance frequency increases with the percent of fir, soil moisture, or exposure to wind. On better sites spruce stands will easily persist more than 200 years.                                                                                                                                                                                                                                                                                                                                                                                                |
| <b>Single-tree and Group Selection</b>       | ✓ Single-tree or group-selection harvests emulate the natural disturbance patterns of better-drained spruce-fir sites where mixed spruce-northern hardwood stands are found.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
| <b>Shelterwood, Patch Cuts, and Clearcut</b> | <ul style="list-style-type: none"> <li>✓ An irregular shelterwood system with reserve trees and patches resulting in a two-aged stand will mimic the cyclical natural disturbance pattern frequently found on poorer-quality sites that are naturally dominated by spruce-fir. Use this approach to create and maintain abundant browse and cover needed by snowshoe hare (see species profile, Section 6), critical prey for bobcat and the threatened Canada lynx. Moose, magnolia warblers, spruce grouse, ruffed grouse, and other young-forest species will also benefit. Optimum hare browse is found in dense regeneration that is 5-20 years old.</li> <li>✓ True clearcuts are less appropriate for maintaining the natural forest community because they create excessive competition from hardwoods and raspberries, which adversely impacts spruce-fir regeneration and ground cover.</li> <li>✓ Where management objectives result in complete overstory removal in the shelterwood or clearcut system, leave “islands” of reserve trees. See stand-level guidelines (Section 7).</li> </ul> |
| <b>Other</b>                                 | <ul style="list-style-type: none"> <li>✓ Follow recommendations for snags, cavity trees, and downed woody material and other stand-level guidelines (Section 7).</li> <li>✓ Favor spruce over fir in intermediate thinnings and harvests. Increasing the percentage of spruce will decrease susceptibility to spruce budworm, which prefers fir, and the longer life span of spruce will allow more management flexibility.</li> <li>✓ See guide to landscape-scale forestry (Section 8) and guidelines for American marten (Section 6).</li> <li>✓ In northwestern Maine where lynx may be found, check with the Maine Department of Inland Fisheries and Wildlife (MDIFW).</li> <li>✓ In northern and eastern Maine, work with MDIFW to develop a long-term plan for managing deer wintering areas.</li> </ul>                                                                                                                                                                                                                                                                                          |

**Mixed Spruce-Fir Northern Hardwood Forests:** In general, for mixedwood stands up to 1/3 spruce-fir and other softwoods, use the northern hardwood recommendations; for mixedwood stands with 1/3 to 2/3 in conifers, consider both the northern hardwood and spruce-fir recommendations; for mixedwood with more than 2/3 in conifers, use the spruce-fir recommendations.

**References** Carlson 1999 (see Section II, Enriched Hardwood Forests); DeGraaf et al. 1992; DeGraaf and Yamasaki 2001; Eyre 1980; Flatebo et al. 1999; Frank and Bjorkbom 1973; Fuller and Harrison 2000; Koehler and Brittell 1990; MNAP 2001; Payer and Harrison 2000a, 2000b, 2003; Seymour 1994



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