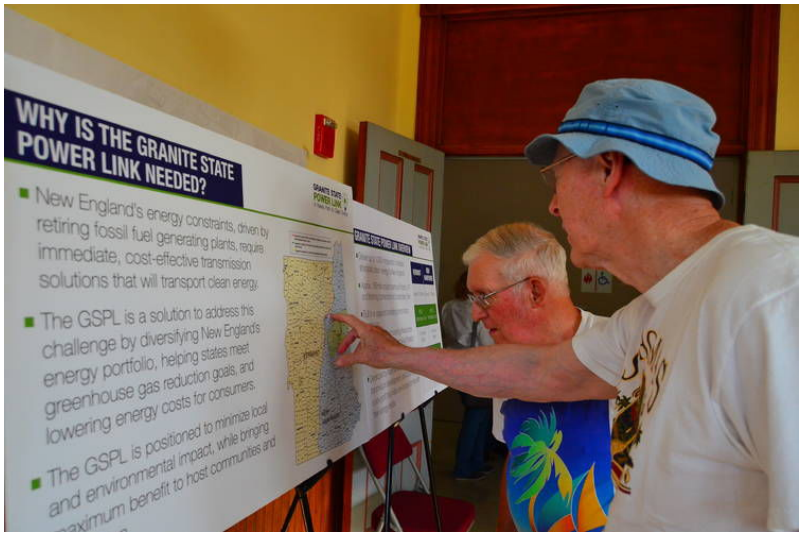


GRANITE STATE POWER LINK

A Ready Path to Clean Energy

Presidential Permit Application

United States Department of Energy

December 22, 2017

40 Sylvan Road
Waltham, MA 02451

December 22, 2017

BY HAND DELIVERY

U.S. Department of Energy
Office of Electricity Delivery and Energy Reliability
Attention: Christopher Lawrence, OE-20
1000 Independence Avenue, SW
Washington, DC 20585

Re: Granite State Power Link Presidential Permit Application

Dear Mr. Lawrence:

In accordance with Executive Order 10485, as amended by Executive Order 12038, GridAmerica Holdings Inc. ("GridAmerica") hereby submits an Application for a Presidential Permit to the Department of Energy ("DOE") for the Granite State Power Link Project (the "Project") to authorize the construction, operation, maintenance, and connection of new electric transmission facilities between the Canadian Provence of Quebec and Monroe, New Hampshire, including a crossing of the international border at Norton, Vermont.

The enclosed application has been prepared in accordance with DOE's applicable administrative procedures at 10 C.F.R. § 205.320 *et seq.* and DOE's related guidance. The original application, five paper copies and an electroonic copy of the application is enclosed with this submittal. The $150 application filing fee has also been enclosed with this submittal.

I look forward to working with your office as we proceed with this important project to deliver renewable into New England. I welcome the opportunity to discuss this matter with you at any time. Should you have any additional questions or comments regarding this application, please contact me at (781) 907-2152 or by email at Joseph.Rossignoli@nationalgrid.com.

Very truly yours,

Joseph Rossignoli
Director, U.S. Business Development
GridAmerica Holdings Inc.

Enclosures
Original application with attachments, five hard copies and one electronic copy

cc: Kimberly D. Bose, Secretary, Federal Energy Regulatory Commission (one hard copy)
Judith C. Whitney, Clerk of the Commission, Vermont Public Utility Commission (one hard copy)
James Porter, Vermont Dept. of Public Service (one hard copy)
Debra A. Howland, Executive Director, New Hampshire Public Utility Commission (one hard copy)
Pamela G. Monroe, Administrator, New Hampshire Site Evaluation Committee (one hard copy)

UNITED STATES OF AMERICA

BEFORE THE

DEPARTMENT OF ENERGY

OFFICE OF ELECTRICITY DELIVERY AND ENERGY RELIABILITY

Docket No. PP-_____

APPLICATION OF GRIDAMERICA HOLDINGS INC.
FOR A PRESIDENTIAL PERMIT FOR THE
GRANITE STATE POWER LINK

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

December 2017

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

TABLE OF CONTENTS

EXHIBITS

A Opinion of Counsel

B Drawings of Typical Structure Configurations

Figure 2-1	Cross-Section - US/Canada Border to Mile 0.5
Figure 2-2	Cross-Section - Mile 0.5 to Mile 46.65
Figure 2-3	Cross-Section – Mile 46.65 to Mile 52.15
Figure 2-4	Cross-Section – Mile 52.15 to Mile 53.17
Figure 2-5	Cross-Section – Mile 53.17 to Mile 58.23
Figure 2-6	Cross-Section – Mile 58.23 to New Converter Station

C General Area Map – Proposed Corridor

D Area Map of Border Crossing

E System Power Flow Plan (To be submitted at a later date)

F Sections 3 and 4 Figures

Figure 3.3-1	Waterbodies Crossed by the GSPL Line
Figure 3.4-1	NWI Wetlands Crossed by the GSPL Line
Figure 3.5-1	Vegetation in the GSPL Project Area
Figure 3.7-1	Vermont Natural Communities & New Hampshire Exemplary Communities
Figure 3.8-1	Conservation Lands Crossed by the GSPL Line
Figure 3.8-2	Roads and Railroads Crossed by the GSPL Line
Figure 3.11-1	Visual simulation of GSPL Line – Silvio O. Conte NFWR, Vermont
Figure 3.11-2	Visual simulation of GSPL Line – West Mountain WMA, Vermont
Figure 3.11-3	Visual Simulation of GSPL Line – Victory State Forest, Vermont
Figure 4.1-1	Norton Converter Station Alternative Sites
Figure 4.1-2	Monroe Station Alternative Sites
Figure 4.1-3	GSPL Siting Region and Alternative Corridors

G Existing Resource Information – Raw Data Tables

- Soils Crossed by the GSPL Centerline
- Waterbody Crossings
- Vermont Wetlands Crossed by the GSPL Centerline
- New Hampshire Wetlands Crossed by the GSPL Centerline
- Land Use and Vegetation Crossed by the GSPL Centerline
- Conserved Lands Crossed by the GSPL Centerline
- Roads and Railroads Crossed by the GSPL Centerline

H Public Involvement and Agency Coordination

I Project Schedule

J Verification of Application

TABLES

ACRONYMS AND ABBREVIATIONS

AC	alternating current
ACSR	Aluminum-Conductor Steel-Reinforced
AC/DC	alternating current/direct current
APE	area of potential effect
Applicant or GridAmerica	GridAmerica Holdings Inc.
BGEPA	Bald and Golden Eagle Protection Act
BMPs	best management practices
CDM	Construction Design Management Areas
DC	direct current
DC/AC	direct current/alternating current
DO	dissolved oxygen
ESA	Endangered Species Act
ETU	Elective Transmission Upgrade
FEMA	Federal Emergency Management Agency
FS	Feasibility Study
GSPL Line	Proposed GSPL +/- 400 kV HVDC Line
GSPL Project or Project	Granite State Power Link
HVDC	high voltage direct current
IBAs	Important Bird Areas
IGBT	Insulated Gate Bipolar Transistor
ISO-NE	Independent Service Operator-New England
kcmil	thousand circular mil
km	kilometers
kV	kilovolt
MBTA	Migratory Bird Treaty Act
Monroe Converter Station	converter station located in Monroe, New Hampshire
MOU	Memorandum of Understanding
MW	megawatt
NAAQS	National Ambient Air Quality Standards
NEP	New England Power Company d/b/a/ National Grid
NEPA	National Environmental Policy Act
NERC	North American Electric Reliability Corporation
NESC	National Electrical Safety Code
NFIP	National Flood Insurance Program
NFWR	National Fish & Wildlife Refuge
NGO	non-governmental organization
NHDES	New Hampshire Department of Environmental Services
NHDHR	New Hampshire Division of Historical Resources
NHFG	New Hampshire Fish and Game Department
NH NHB	New Hampshire Natural Heritage Bureau
NHPA	National Historic Preservation Act

Norton Converter Station	converter station located in Norton, Vermont
NO_2	nitrogen dioxide
NPCC	Northeast Power Coordinating Council
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
NVDA	Northeastern Vermont Development Association
NWI	National Wetland Inventory
O_3	ozone
O&M	Operation and Maintenance
OPGW	fiber optic ground wire
ORW	Outstanding Resource Water
Pb	lead
PM	particulate matter
PM_{10}	particulate matter with a nominal aerodynamic diameter of 10 microns or less
$PM_{2.5}$	particulate matter with a nominal aerodynamic diameter of 2.5 microns or less
REMI	Regional Economic Models, Incorporated
RMPP	New Hampshire Rivers Management and Protection Program
ROW	right-of-way
RTE	rare, threatened and endangered
SHPO	State Historic Preservation Officer
SIS	System Impact Study
SO_2	sulfur dioxide
SPCCP	Spill Prevention, Control, and Countermeasures Plan
SRHP	State Register of Historic Places
U.S.	United States
USACE	U.S. Army Corps of Engineers
USDA	U.S. Department of Agriculture
USDOE	U.S. Department of Energy
USEPA	U.S. Environmental Protection Agency
USFWS	U.S. Fish and Wildlife Service
VANR	Vermont Agency of Natural Resources
VDEC	Vermont Department of Environmental Conservation
VDHP	Vermont Division for Historic Preservation
VT DFPR	Vermont Department of Forests, Parks and Recreation
VELCO	Vermont Electric Power Company
VFWD	Vermont Fish and Wildlife Department
VNHI	Vermont Natural Heritage Inventory
VSC	voltage source converter
VWR	Vermont Wetland Rules
WMA	Wildlife Management Area

1.0 INFORMATION REGARDING THE APPLICANT – §205.322(a)

1.1 LEGAL NAME OF APPLICANT – §205.322(a)(1)

GridAmerica Holdings Inc. ("GridAmerica") is the legal name of the Applicant for this Presidential Permit for the Granite State Power Link Project ("GSPL Project" or "Project"). GridAmerica is a direct wholly-owned unregulated subsidiary of National Grid USA ("National Grid USA" and its subsidiaries, collectively, "National Grid"). The Applicant has its principal place of business at 40 Sylvan Road, Waltham, MA 02451.

1.2 LEGAL NAME OF ALL PARTNERS – §205.322(a)(2)

GridAmerica is the sponsor of the GSPL Project. The GSPL Project will ultimately be held by a new Project-specific company to be set up as a direct wholly-owned subsidiary of GridAmerica. Pursuant to an arrangement between Citizens Enterprises Corporation ("Citizens Energy") and GridAmerica, Citizens Energy has an option to acquire a 10 percent interest in the GSPL Project. Citizens Energy Corporation is a non-profit company founded in 1979 and headquartered in Boston, MA. Citizens Energy Corporation uses profits from the businesses it owns and manages to provide funding for charitable and social programs that it operates to assist low-income families and the elderly.

1.3 COMMUNICATIONS AND CORRESPONDENCE – §205.322(a)(3)

All communications and correspondence regarding this application should be addressed to:

Mr. Joseph Rossignoli
Director, U.S. Business Development
GridAmerica Holdings Inc.
40 Sylvan Road
Waltham, MA 02451
(781) 907-2152
Joseph.Rossignoli@nationalgrid.com

Mr. Timothy Roskelley
Anderson & Kreiger LLP
50 Milk Street
Boston, MA 02109
(617) 621-6539
roskelley@andersonkreiger.com

1.4 FOREIGN OWNERSHIP AND AFFILIATIONS – §205.322(a)(4)

GridAmerica is not owned wholly or in part by a foreign government or an instrumentality thereof. The GSPL Project transmission facilities will not be owned wholly or in part by a foreign government or an instrumentality thereof. GridAmerica does not have any agreement pertaining to ownership by or assistance from any foreign government or instrumentality thereof in connection with the GSPL Project.

1.5 FOREIGN CONTRACTS – §205.322(a)(5)

At this time, the applicant does not have any power purchase agreements, transmission service agreements, or arrangements of similar nature with any foreign government or any foreign private concerns that directly relate to the purchase, sale or delivery of electric energy.

1.6 OPINION OF COUNSEL – §205.322(a)(6)

As set forth in the attached opinion of counsel (Exhibit A), the construction, connection, operation or maintenance of the proposed transmission facilities are within the corporate powers of GridAmerica. Further, GridAmerica has complied with, or will comply with, all pertinent federal and state laws related to the construction, operation or maintenance of the proposed GSPL Project.

2.0 INFORMATION REGARDING THE PROPOSED TRANSMISSION FACILITY

2.1 PURPOSE AND NEED FOR THE PROJECT

GridAmerica proposes to construct the GSPL Project to bring approximately 1,200 megawatts ("MW") of renewable electric power from Quebec, Canada to the New England power grid. The demand for additional, reliable sources of electric power into the New England power system generally, and for renewable power in particular, is high. Part of this demand has been created by state requirements to increase the availability and use of renewable power, including a March 2017 Request for Proposals for Long-Term Contracts for Clean Energy Generation Projects issued on March 31, 2017 by the electric distribution companies of the Commonwealth of Massachusetts and Massachusetts Department of Energy Resources. GridAmerica has developed the GSPL Project to respond to this demand.

GridAmerica's transmission delivery strategy seeks to utilize high efficiency technologies, such as high voltage direct current ("HVDC") transmission lines, and efficient siting techniques, such as minimizing transmission line length to reduce power losses, in order to maximize reliable energy delivery. At the same time, GridAmerica has sought to minimize environmental impacts by leveraging co-location along existing corridors, which provides numerous and broadly acknowledged and accepted advantages over siting a new transmission line in a new corridor. The Project is also being developed mindful of costs, design feasibility, construction feasibility, and future operations and maintenance requirements. The result is a project that is consistent with the public interest: it provides the benefits of a new supply of renewable energy and the related economic benefits of constructing, operating and maintaining a major infrastructure asset, while utilizing an environmentally-sensitive project route and design that will not adversely impact electric reliability in the region.

2.2 PROJECT OVERVIEW

The GSPL Project consists of the installation of new electric transmission facilities between the Canadian Provence of Quebec and Monroe, New Hampshire. Two new 315 kilovolt ("kV") overhead double circuit alternating current ("AC") lines supported by a single structure will extend from the international border between Canada and the United States ("U.S.") for approximately 0.5 miles (0.8 kilometers ["km"]) to an alternating current/direct current ("AC/DC") converter station located in Norton, Vermont ("Norton Converter Station"), providing power from the Canadian Provence of Quebec. A new ±400kV overhead High Voltage Direct Current ("HVDC") electric transmission line (the "GSPL Line") will connect the new Norton Converter Station to a new direct current/alternating current ("DC/AC") converter station located in Monroe, New Hampshire ("Monroe Converter Station"). The proposed GSPL Line will extend a distance of approximately 59 miles through Vermont and New Hampshire.

315kV Overhead Double Circuit AC Lines

Starting at the international border, GSPL will continue to bring two 315kV overhead transmission lines supported by a single structure (double circuit 315kV AC lines) south for approximately 0.5 miles parallel to the existing 200-foot-wide Quebec-New England HVDC right-of-way ("ROW"). Figure 2-1 in Exhibit B shows the ROW configuration proposed for the first 0.5 mile of the Project. An expansion of approximately 125 feet on the western edge of ROW will be necessary to facilitate the installation, operation, and maintenance of the new 315kV lines.

The new double circuit 315kV AC lines will be terminated at a dead-end structure and transitioned to underground cross-linked polyethylene ("XLPE") cables. The cables will continue from the overhead line dead end structure for a very short distance to a point inside the proposed Norton Converter Station yard.

Norton Converter Station

The Norton Converter Station will have a footprint of approximately 7 acres on an existing 149-acre parcel of land located north of Vermont State Route 114 and east of the existing Quebec-New England HVDC ROW. The entire station will be surrounded by a fence meeting the requirements of the National Electric Safety Code ("NESC"). The converter station auxiliary systems will be normally powered from the high voltage transmission system connected to GSPL, with a backup supply from the local distribution utility. There will be an on-site emergency generator used as emergency supply to the converter station auxiliary systems when both the normal auxiliary supply and backup auxiliary supply are unavailable.

GSPL Line

The GSPL Line will extend from the Norton Converter Station over a length of approximately 59 miles to a new DC/AC converter station in Monroe, New Hampshire. The structures supporting the new GSPL Line will generally be similar in form and color to those supporting the existing Quebec-New England HVDC line. The proposed structures are tubular steel poles with a self-weathering finish featuring two vertical elements, a cross-arm supporting the two poles, and two shield wire extensions. Where it is practicable, the new GSPL Line structures will be placed directly adjacent to the existing Quebec-New England HVDC line structures.

From its point of origin at the Norton Converter Station in Norton, Vermont, the GSPL Line will extend for approximately 47 miles parallel to the existing Quebec-New England HVDC line. The centerline of the new GSPL Line will be located 150 feet east of the existing Quebec–New England HVDC line requiring the existing ROW to be expanded by approximately 150 feet. The expansion of the ROW will encompass approximately 850 acres. This portion of the Project is detailed in Figure 2-2 in Exhibit B.

Between Mile 46.65 and Mile 52.15, the GSPL Line will be installed along the eastern most edge of an existing ROW containing the Quebec-New England HVDC line, the Eversource 115kV Q195 line, and the New England Power Company ("NEP") 34.5kV 3314 line. The existing ROW is 335 feet-wide in this portion of the Project. The centerline of the new GSPL Line will be located 100 feet to the east of the centerline of the 34.5kV 3314 line. Approximately an additional 150 feet of ROW will be needed to support the installation, operation, and maintenance of the new GSPL Line. Locations of the new GSPL Line structures in this portion of the ROW will be refined to enhance constructability given the steep side slope and rugged nature of the terrain. Please refer to Figure 2-3 in Exhibit B for details.

The portion of GSPL Line between Mile 52.15 and Mile 53.17 will be located generally 150 feet east of the existing Quebec-New England HVDC line. This section of the ROW also includes several crossings of existing transmission lines, the crossing of the Connecticut River and the crossing of the Interstate 93 highway corridor. Due to the design complexities in this portion of the ROW and the need to avoid existing facilities, it may be necessary to expand the ROW greater than what has been proposed previously. See Figure 2-4 in Exhibit B for details.

From Mile 53.17 to Mile 58.23, in New Hampshire, the existing ROW varies in width between 375 and 400 feet and contains the existing Quebec-New England HVDC line, the NEP 34.5kV 3315 line, and the NEP 230kV C203 and D204 lines. To accommodate the GSPL Line while reducing the total amount of ROW expansion required, GSPL has been working with NEP in proposing to relocate and reconstruct the existing 230kV C203 and D204 lines on new single circuit delta configured tubular steel structures with a

weathering steel finish. The 230kV C203 line would be relocated approximately 95 feet to the east of its existing centerline and the 230kV D204 line would be relocated approximately 115 feet east of its current centerline. The proposed relocation of these two circuits will allow for the installation of the GSPL Line in the existing ROW 150 feet to the east of the existing Quebec-New England HVDC line. The width of the additional ROW will vary between approximately 50 and 75 feet to accommodate the relocation of the existing 230kV AC circuits. The ROW expansion in this portion of the ROW will cover approximately 95 acres. Figure 2-5 in Exhibit B for shows the ROW configuration for this portion of the Project.

From mile 58.23 to the Monroe Converter station the GSPL Line will extend from the existing ROW containing the Quebec-New England HVDC line into the Monroe Converter Station. The GSPL Line will be the sole occupant of this approximately 1-mile-long corridor. The proposed ROW width will be approximately 200 feet (Figure 2-6 in Exhibit B).

Monroe Converter Station

The GSPL Line will terminate at a new converter station in Monroe, New Hampshire at which point the power will be converted from direct current ("DC") to AC. The Monroe Converter Station will be connected to the existing New England transmission system through a new 345kV substation. The Monroe Converter Station will occupy approximately 14 acres of an existing 85-acre parcel located north of New Hampshire Route 135. The entire station will be surrounded by a fence meeting the requirements of the NESC. The converter station auxiliary systems will be normally powered from the high voltage transmission system connected to GSPL, with a backup supply from the local distribution utility. There will be an on-site emergency generator used as emergency supply to the converter station auxiliary systems when both the normal auxiliary supply and backup auxiliary supply are unavailable.

2.3 TECHNICAL DESCRIPTION

Number of Circuits

There will be two overhead 315kV AC circuits supported by double circuit structures from the international border for approximately 0.5 miles (0.8 km) connecting to transition structures that will direct the parallel 315kV AC lines underground for approximately 600 feet into the Norton Converter Station yard in Norton, Vermont.

From the Norton Converter Station to the Monroe Converter Station the GSPL Line will be a single ±400kV overhead HVDC transmission line approximately 59 miles (95 km) in length.

Operating Voltage and Frequency

The nominal operating voltage for the GSPL Line will be 400kV and will consist of two poles. The positive pole includes positively energized conductors and the negative pole including negatively energized conductors. The nominal operating voltage of the two AC lines between the international border and the Norton Converter Station will be 315kV, three phase at a frequency of 60Hz.

Conductors

The 315kV AC lines will have Aluminum-Conductor Steel-Reinforced ("ACSR") conductor with the designation of 1,590 thousand circular mil ("kcmil") ACSR "Falcon". This conductor type has an outside diameter of 1.545 inches. The 315kV AC circuits will use a two-conductor bundle per phase.

The GSPL Line conductor will employ a three-conductor bundle for the positive and negative energized poles. The bundles will consist of ACSR conductors. Each conductor has a designation of 2,156 kcmil ACSR "Bluebird" and has an outside diameter of 1.762 inches.

All conductors installed as part of the GSPL Project will have a pre-dulled (non-specular) finish to reduce visual impacts.

Shield Wires

The shield wires (also known as static wires or earth wires) will be installed on the structures to provide protection from lightning and to serve as a communications path. The GSPL Line and 315kV AC line will each feature two shield wires. The GSPL Line will feature one fiber optic ground wire ("OPGW") and one 3/8 inch extra high strength steel wire. The OPGW cable consists of a combination of aluminum and aluminum clad wires wound around an aluminum tube that holds optical fibers that allow for station to station communications. Both the OPGW and 3/8 inch EHS extra high strength steel wire will have similar dimensional and mechanical properties and will be approximately 0.36 inches in diameter.

Additional Project Design Information

Overhead Transmission Line Structures

GSPL proposes to use tubular steel pole structures to support all overhead transmission line elements associated with the Project. Figures 2-1 through 2-6 in Exhibit B provide visual details for the structure types specific to each proposed circuit. All steel pole structures associated with the Project will have a self-weathering finish.

The proposed structure heights for each portion of the Project are shown on Figures 2-1 through 2-6 in Exhibit B. The heights associated with the double circuit 315kV AC structures extending from the international border to the Norton Converter Station are approximately 130 feet. These structures will generally be between 3 to 5-feet-wide at the base and be supported by a single reinforced concrete foundation at the base of each steel pole with an average span of approximately 900 feet and a maximum span of approximately 1,100 feet. The overall width of these structures inclusive of the arms is approximately 28 feet.

The heights associated with the GSPL Line structures between the Norton Converter Station and the Monroe Converter Station will range in height from approximately 75 feet to 115 feet. The average span will be approximately 875 feet and maximum span length approximately 1,450 feet. These structures, as illustrated in Figure 2-1 through 2-6 (Exhibit B), will consist of two vertical steel pole elements connected by a cross-arm supporting both poles of the GSPL Line. The structures will feature cross-bracing as necessary and incorporate two shield wire bayonets to provide lightning protection for the circuit. The overall width of these structures inclusive of the arms is approximately 70 feet.

Structure Design Parameters

The GSPL Project transmission structures and components will be designed in accordance with applicable national and state codes and regulations as well as Project specific standards. The most stringent of these regulations is the current NESC, which specifies both the minimum structural loads for determining the required structural capacity and appropriate clearances to energized parts and wires. Typical clearance requirements defined by the NESC include clearances to ground, adjacent overhead electric power lines, roads, railroads, buildings, and other facilities.

The current NESC, American Society of Civil Engineers ("ASCE"), as well as Project-specific criteria, will determine the structural loading of the GSPL Project transmission lines. The minimum load criteria will include:

- NESC Heavy Loading – ½ inch radial ice at 0°F with a 40 mph wind;
- NESC High Wind Loading – 90 mph wind at 60°F;
- NESC Ice and Wind Loading – ¾ inch radial ice at 15°F with a 40 mph wind; and
- GSPL Heavy Ice Loading – 1 ½ inches of radial ice at 30°F with a 28 mph wind.

Converter Station Design

The Monroe Converter Station and Norton Converter Station will be voltage source converter ("VSC") based designs. VSC design provides for fast reactive and active power flow control and limits the need for the more expansive AC switchyard components as compared to the alternative line-communicated converter station design. This leads to several benefits including a smaller relative land footprint and lower AC system impacts.

The main converter station components and their functions include:

- Power Transformers: To convert the AC voltage from the primary AC network voltage to the required AC voltage level for the converter station power electronics.

- Outdoor AC Substation Equipment: AC circuit breakers, disconnect switches, AC reactors (inductors), instrument transformers, bus work, and support structures with insulators will be included in the outdoor converter station yard. The circuit breakers and disconnect switches provide the means to isolate the converter station from the AC network.

- Valve Hall: Contains the power electronics (valves) that switch at high speed to convert HVAC power to HVDC power or HVDC power to HVAC power to allow for power flow across the DC transmission system. Insulated Gate Bipolar Transistors ("IGBT") are the principle power electronic components.

- Valve Cooling: The IGBT valves will be cooled with a closed loop water system. The cooling system will include outdoor dry-type cooling towers.

- Outdoor DC Substation Equipment: Disconnect switches, smoothing reactors (inductors), control and measure equipment, bus work and support structures with insulators will be included in the outdoor DC yard. The disconnect switches will allow the GSPL Line to be disconnected from the converter station. The smoothing reactors limit the transient current that can be applied to the IGBT valves from disturbances on the GSPL Line.

- Lightning Protection: The outdoor yards will include overhead shield wires and support structures to provide protection from lightning strikes in accordance with industry standards and practice.

- Control and Protection Equipment: A redundant control and protection system will be housed within an indoor control and protection room. The control and protection system will monitor signals from various equipment within the converter stations and take automatic actions to protect the overall HVDC transmission system in the event of faults or malfunctions. The control and protection system will also change control quantities based on operation actions. A set of redundant

protections, independent from the HVDC control and protections, will be installed to protect the connections to the AC transmission interface.

- Operations Room: An operations room will be located at each converter station to serve as either the primary or back-up operations location.

- Other Buildings: Other buildings will serve as storage locations for spare parts and equipment and will provide space and facilities for personnel during on-site operations and maintenance activities.

AC System Interconnection and Support Projects

The Independent Service Operator-New England ("ISO-NE") Tariff Section I.3.9 requires the preparation of a System Impact Study ("SIS") for any transmission project. To date, the ISO-NE evaluation process has identified potential AC system upgrades, summarized below, to support the delivery of 1,200 MW. While these facility upgrades are not within the scope of the Presidential Permit, this information is being provided to aid the U.S. Department of Energy "(USDOE") in its overall evaluation of the electric reliability impacts of the Project.

- The GSPL Project's interconnection to the New England electric system will be at a new AC substation constructed in Monroe, New Hampshire by NEP. The new AC substation will have terminals for two new 345kV AC lines and two 230kV AC tie lines.
- The existing 230kV A201 and B202 lines will be upgraded to 345kV between the new AC Substation in Monroe, New Hampshire and a proposed new substation located in Londonderry, New Hampshire.
- The existing 230kV Comerford Substation will be connected to the new AC Substation in Monroe, New Hampshire via two 230kV tie lines.
- Additional 115kV Reconductoring Projects include:
    - Scobie B-172 Tap (6 miles)
    - Scobie – Kingston Tap (8.4 miles)
    - Beebe – Huckins Hill (3 miles)
    - Huckins Hill – Ashland (7 miles)
    - Ashland – Pemigewasset (8 miles)
    - Pemigewasset- Webster (11 miles)
- Additional 34.5kV Sub-Transmission Upgrade Projects

2.4 PROJECT MAPPING

The general area map showing the GSPL Line is provided in Exhibit C. A detailed map showing both sides (U.S. and Canadian) of the border crossing is provided in Exhibit D.

2.5 INFORMATION FOR FACILITIES OPERATED AT 138 KV OR HIGHER

Expected Power Transfer Capability

The Project's rated power transfer capability between the Quebec and New England transmission systems is approximately 1,200 MW. The GSPL HVDC transmission design will allow for a continuous firm transmission capacity rating of 1,200 MW delivered into the New England Transmission System. A higher

amount of power will be withdrawn from the Hydro-Quebec transmission network to account for losses over the GSPL transmission system.

The GSPL converter stations and the overhead transmission line will be designed to support the 1,200 MW of transfer under both summer and winter environmental operating conditions. The applicable design conditions are based on industry standard practice and historic environmental data.

System Power Flow

GSPL began the ISO-NE interconnection study process by requesting a Feasibility Study ("FS"). An Elective Transmission Upgrade ("ETU") interconnection request with ISO-NE was submitted on December 27, 2016 and the Project was assigned Queue Position #627. GridAmerica has not yet received the FS from ISO-NE and will supplement this application when it is received.

Subsequent to the completion of the FS, GSPL will enter into an agreement with ISO-NE to conduct a SIS. It is anticipated that the SIS will be completed in the third quarter of 2018. The SIS report will include stability analysis results and, if requested by the USDOE, GSPL will provide the SIS report as soon as an approved report is available from ISO-NE.

After the issuance of the SIS, GSPL will provide the required power flow diagrams corresponding to heavy and light load levels with and without the proposed interconnection, for the first year the Project is expected to be in service and for the 5th year thereafter.

The GSPL Project will be engineered, designed and implemented to fully comply with ISO-NE requirements such that the project together with AC network upgrades will not have any adverse impact on the reliability or operability of the New England transmission system or the systems of any affected entities.

The selected point of interconnection for the Project in Monroe, New Hampshire together with the network upgrades identified in the ISO-NE system studies will allow energy and capacity to be reliably delivered from green resources located in the Hydro Quebec transmission system to the ISO-NE region over a fully controllable GSPL.

Interference Reduction Data

The GSPL Project will be designed to mitigate any potential electromagnetic interference ("EMI") that could affect television or radio service along the project route. Radio interference is caused by corona occurring on the conductors. The conductor and hardware assemblies associated with the GSPL Line will be designed to reduce to amount of corona produced by operation of the line. Historic concerns relative to EMI impacts to television signals have been significantly reduced with the conversion of broadcast signals from analog to digital in the U.S.

Additional design considerations to minimize EMI associated with the GPSL Project will be developed during the detailed design phase of the Project.

Relay Protection

The relay protection scheme for the Project will be designed pursuant to HVDC industry standards and best utility practice, with full redundancy of the primary protection system. Where applicable, the relay protection scheme will be designed to meet the Northeast Power Coordinating Council ("NPCC"), North American Electric Reliability Corporation ("NERC"), local interconnecting utility, and other requirements when necessary. Specific protection schemes, equipment and functional devices will be determined during the Project's detailed design phase.

System Stability Analysis

As provided in 10 CFR § 205.322(b)(3)(v), the USDOE may require the applicant to prepare a system stability analysis following the USDOE's review of the power flow plots. GSPL will prepare and furnish the system stability analysis upon request.

2.6 CONSTRUCTION METHODOLOGY

Overhead Transmission Line Construction Methods & Sequence

The GSPL double circuit 315kV AC lines and GSPL HVDC Line will be installed utilizing conventional overhead transmission line construction techniques. The transmission lines will be constructed in a progression of activities that will generally proceed as follows:

- Removal of vegetation in advance of construction
- Installation of soil erosion and sediment controls
- Construction of access roads and maintenance of existing access ways
- Installation of foundations and structures
- Installation of conductor and shield wire
- Restoration of the ROW

Construction of the overhead transmission lines will be carefully planned and executed to maximize efficiencies in the construction process, maintain a safe work environment for personnel and contractors, minimize impacts, and comply with environmental regulatory requirements.

The following sections describe the sequence of construction activities that will be used for the installation of the proposed circuits. In some instances, there may be more than one viable construction methodology applicable to the type of work being executed and more than one methodology will be discussed. A summary of typical construction equipment utilized to execute each construction activity follows the descriptions.

Removal of Vegetation and ROW Mowing in Advance of Construction

Prior to vegetation removal and mowing, the boundaries of sensitive areas and wetlands will be clearly marked to prevent unauthorized vehicular encroachment into wetland areas. The use of temporary swamp mats may be required to gain access to and across forested wetlands, to prevent wetland disturbance, and to provide stable platforms for equipment operation. Swamp mats consist of timbers that are bolted together and placed over wetland areas to distribute equipment loads and minimize disturbance to the wetland and soil substrates. Where the ROW crosses streams and brooks, vegetation along the stream bank will be selectively cut to minimize the disturbance of bank soils and the potential for construction related erosion. In environmentally sensitive areas, hand cutting and low ground pressure equipment will be utilized to the greatest extent possible to minimize potential impacts. Additionally, in certain environmentally sensitive areas such as wetlands, it may be necessary and desirable to leave felled trees and snags (standing dead or dying trees) and allow them to decompose in place rather than to disturb soft organic substrates.

Following survey and flagging, the next activity necessary to support the construction of all elements of the Project will be the removal of vegetation from the expanded ROW areas and within the existing ROW to facilitate access, consistent with applicable environmental standards and requisite pre-construction approvals. Tree removal operations will include the removal of tall growing woody species within the ROW as appropriate. Generally, trees to be removed will be cut close to the ground leaving the stumps and roots in place, to minimize soil disturbance except where grading is required for access road improvements

or at sites of structure installation. Small trees and shrubs within the ROW will be removed as necessary with the intention of preserving roots and low growing vegetation to the extent practical.

Brush, limbs, and cleared trees will either be chipped and removed from site, cut and removed from site, or left in place depending on land conditions, permitting requirements, and landowner approval, if needed. Where appropriate, enhancements will be proposed as mitigation for wildlife features that may be lost as the result of tree removal and construction activities.

Installation of Soil Erosion and Sediment Controls

Following the vegetation removal and vegetation management activities, proper erosion and sediment control devices such as straw bales, siltation fencing, and/or chip bales will be installed in accordance with approved plans and permit requirements. The installation of these sediment control devices will be supervised by GridAmerica's contractor, and will be reviewed by the Project's Construction Supervisor and/or designated environmental monitor. The erosion and sediment controls will be installed between the work area and environmentally sensitive areas such as wetlands, streams, drainage courses, roads, and adjacent property when work activities will disturb soils and result in a potential for erosion and sedimentation. The devices will be monitored regularly and will function to mitigate construction-related erosion and sedimentation, and will also serve as a physical boundary to delineate resource areas and to contain construction activities within approved areas. In addition to installation of erosion and sediment controls, the Project will develop and implement a plan, including Spill Prevention, Control, and Countermeasures Plan ("SPCCP") if required, to minimize the potential for release of oils, lubricants and fuels into sensitive resource areas, such as wetlands and streams. The plan will detail requirements for containment and cleanup equipment and procedures, refueling procedures, storage of bulk quantities, etc.

ROW and Work Site Access

It is anticipated that the existing roads providing access to the existing Quebec-New England HVDC line will be used to access the GSPL ROW and work sites. Off-ROW access consists primarily of an existing network of gravel and paved roads. At this time, new roads are not anticipated to be needed to support off-ROW access; however, maintenance or upgrades, such as placement of clean gravel or trap rock to stabilize and level the roads for construction vehicles, may be necessary to support the proposed construction activities at some locations. In addition, spurs will need to be constructed to access the proposed structure locations from the existing ROW access roads. Each stream crossing will be assessed to determine if an upgrade of the existing culvert or crossing measure will be needed to support construction. If stream crossing upgrades are necessary, they will be undertaken in accordance with permitting requirements and best management practices ("BMPs").

Swamp mats will be used to provide access across wetlands where needed. Such temporary swamp mat access roads will be removed following completion of construction and, if necessary, areas will be restored to re-establish pre-existing topography and hydrology. Herbaceous vegetation in disturbed areas will be restored in accordance with regulatory requirements and may include the use of native wetland or conservation seed mix.

Upland work pads will be created at structure locations by grading or adding gravel or crushed stone to provide a level work surface for construction equipment and crews. Once construction is complete, the work pad locations will be stabilized with topsoil as required and mulched to allow vegetation to re-establish. In wetlands, these work pads will be created with swamp mats. Some grading and removal of stumps may be required to provide a level work space for equipment and personnel.

Any access road improvements and/or maintenance will be carried out in compliance with the conditions and approvals of the appropriate federal, state, and local regulatory agencies. If necessary, exposed soils on access roads will stabilized to suppress dust generation. Crushed stone aprons will be used at access road entrances to public roadways to clean the tires of construction vehicles and minimize the migration of soils off-site.

Installation of Foundations and Structures

Proposed structures include tubular steel pole structures with direct embedment, caisson foundations, or micro-pile foundations. Excavation for direct embedment structures will range from approximately 10 to 15 feet in depth and will be of varying diameters, typically 3 to 5 feet. A steel corrugated metal pipe will then be placed vertically in the hole.

Direct embedded steel pole structures will be installed by placing the bottom-most steel pole section or sections into the corrugated metal pipe, installing ¾-inch crushed stone (tamped at 12-inch intervals), and then assembling the upper portion of the steel pole structure. The assembly of the uppermost section will vary by structure type but generally for a single pole structure, the second and third (if necessary) vertical segments of the steel pole will be bolted to the lowest steel pole element, the appropriate structure arms will be installed, and lastly the insulators and hardware associated with making the connection to the vangs or arms as appropriate will be attached. In the case of the GSPL HVDC structures, a similar process will occur with two vertical poles being erected, followed by the installation of the interior cross-arm and outboard arms, shield wire bayonets, and then the insulators and associated hardware will be affixed to the cross-arms and bayonets at the appropriate attachment points.

Certain structures will require reinforced concrete caisson foundations, typically 20 to 30 feet deep, with diameters between 6 and 10 feet. Caissons will be constructed by drilling a vertical shaft, installing a permanent casing, lifting a steel reinforcement cage into place via a crane, placing steel anchor bolts, pouring concrete, and backfilling as needed. Steel pole elements will then be lifted into place with a crane and built out according to structure type.

In areas where there is competent rock at grade or in other locations where access by larger foundation installation equipment might be limited, the use of micro-pile foundations will be explored. Micro-pile foundations consist of a cluster of five to nine-inch steel casings set into the ground with high strength reinforcing steel inserted into the casing and backfilled with a flowable grout. The steel casings are typically placed into a rock socket that has been cored out by a rock coring/drilling machine. The tubular steel pole structure is affixed to the micro-pile foundation via a steel adapter plate that has a lower section that aligns with the micro-pile cluster dimensions and an upper section that aligns with the base plate dimensions of the steel pole.

Rock that is encountered during foundation excavation will generally be removed by means of drilling. Dewatering may be necessary during excavations or concrete pouring for foundations. At all times, dewatering will be performed in compliance with applicable regulatory standards and permit requirements, and BMPs that are consistent with established BMPs used by utilities operating in Vermont and New Hampshire. The dewatering basin and all accumulated sediment will be removed following dewatering operations and the area will be seeded and mulched.

Another option for rock removal that could be utilized on the Project is blasting. Coordination with local fire officials, state permitting authorities and notice to the public will be critical to ensuring the success and safety of such an operation. Only qualified vendors with a proven track record of safely delivering similar

scopes of work would be permitted on site. Additionally, considerations would be given to the adjacent Quebec-New England HVDC Line as a part of any blasting plan.

Given the steep terrain along the ROW, helicopters may be utilized to lift manpower, materials, and equipment to specific locations as well as to install the new conductors. These locations will be based on a holistic review of access options, type of construction required for a specific location, environmental impacts, and potential hazards associated with both ground line and aerial access to a site.

Staging areas, stockpiles of excavated materials, equipment storage, and refueling stations will be situated in uplands at least 100 feet from wetlands in accordance with regulatory approvals. Where structures requiring concrete foundations are located near wetlands, proper sedimentation controls will be installed to prevent impacts to these areas, unless equipment such as a drill rig cannot be moved. Stockpiles will be enclosed by staked straw bales or other sediment controls. Additional controls such as watertight mud boxes may be used for saturated stockpile management in work areas in wetlands (e.g. swamp mat platforms) where sediment-laden runoff would pose an issue for the surrounding wetland. Materials will not be placed in wetland resource areas. Following the backfilling operations, excess soil will be spread over unregulated upland areas or removed from the site in accordance with permitting requirements and BMPs.

Installation of Conductor and Shield Wire

Following the erection of transmission structures and installation of the insulator assemblies, the conductor and shield wire will be installed. Conductors, shield wire, and OPGW will be installed using stringing blocks, wire pulling ropes, and wire stringing equipment. Once the stringing blocks have been installed, a pulling rope will be installed.

Once the pulling rope has been installed, the rope is attached to wire stringing equipment and is used to pull the conductors from a wire reel on the ground through the stringing blocks attached to the structure. Once the conductor or shield wire has been installed, the wire pulling equipment is then used to sag the wire to obtain the specified conductor tension.

During the stringing operation, temporary guard structures or boom trucks will be placed at road and highway crossings and at crossings of existing utility lines. These guard structures are used to ensure public safety and uninterrupted operation of other utility equipment by keeping the wire off the traveled way and away from other utility wires at these crossing locations.

Restoration of the ROW

Restoration efforts, including removal of construction debris, final grading, stabilization of disturbed soil, and installation of permanent sediment control devices, will be completed following the construction operations. All disturbed areas around structures and other graded locations will be seeded with an appropriate seed mixture and/or mulched to stabilize the soils in accordance with applicable regulations. Temporary sediment control devices will be removed following the stabilization of disturbed areas. Pre-existing drainage patterns, ditches, roads, walls, and fences will generally be restored to their former condition. Regulated environmental resource areas that are temporarily disturbed by construction will be restored in accordance with applicable permit conditions.

Converter Station Construction Methods & Sequence

The installation of the Norton Converter Station and the Monroe Converter Station will be completed utilizing typical electric substation construction techniques. The converter stations will be constructed in a progression of activities that will generally proceed as follows:

- Surveying and marking of construction site limits
- Installation of soil erosion and sediment controls at the site limits
- Removal of vegetation and site clearing
- Preliminary site grading
- Installation of subsurface structures
- Installation of buildings and equipment
- Facility commissioning
- Demobilization of temporary facilities

The construction of the converter stations will be carefully planned and executed to maximize efficiencies in the construction process, maintain a safe work environment for personnel and contractors, and to comply with environmental regulatory requirements.

The following sections describe the sequence of construction activities that will be used for the installation of the converter stations at both the Norton and Monroe converter sites.

Surveying of the Construction Site Limits

Prior to the start of any site activities, the entire site construction boundary will be identified. These site limits will be based on the final construction design drawings. Field marking of this boundary will prevent the unauthorized encroachment or unnecessary disturbance of environmental features located outside the required construction area.

Installation of Erosion and Sediment Controls

Erosion and sediment control devices will be installed following the delineation of the site construction boundary. These devices will be installed between the work areas and the undisturbed potions of the parcels. These measures will prevent the movement of soils and sediments outside the construction areas. Minor vegetation removal maybe necessary for the installation of erosion and sediment control devices.

Removal of Vegetation and Site Clearing.

All vegetation will be removed from within the converter construction site limits and access road limits. Mature trees will be removed using typical timber harvesting methods with other vegetation removed using common land clearing techniques. After the removal of vegetation, the remaining stumps and roots will be removed from the soil. All vegetation, stumps, and roots removed from the site will be disposed of offsite in accordance with permitting requirements and BMPs.

Once the site is cleared of vegetation, the remaining loam, topsoil, and other unsuitable soils will be stripped from the site. These materials will be stockpiled on site for later re-use during the site restoration. All excess materials will be removed offsite in accordance with permitting requirements.

Preliminary Site Grading

Preparation of the converter site will include preliminary site grading. This activity will include heavy earth work to establish the approximate final grade of the site. Depending on the site subsurface conditions,

the use of rock blasting or removal of unsuitable soils may be required. Additionally, it may be necessary to bring in suitable materials to raise the site elevation. These materials will be sourced locally from nearby facilities.

Installation of Subsurface Structures

The installation of subsurface structures will begin after the completion of the preliminary site grading. These subsurface structures include but are not limited to: equipment and building foundations, ground grids, conduits, manholes, stormwater management systems, containment systems, and any other items that will be installed below grade. The installed subsurface structures will then be backfilled and the final site grade will be established.

Installation of Buildings and Equipment

The buildings and converter equipment will be erected upon the previously installed foundations. This includes but is not limited: to building steel, high voltage equipment, transmission line structures, substation bus supports, control cabling and wiring, and auxiliary systems, along with all other items required for the converter station.

Facility Commissioning

Prior to commercial operation of the Project, all equipment and facilities will undergo detailed commissioning. This program will verify the proper installation of every piece of equipment and subsystem installed at the converter station. Additionally, the commission program will verify the equipment operates as designed. Any improper installations or operations will be corrected prior to the completion of commissioning.

Demobilization of Temporary Facilities

All temporary facilities will be removed from the converter site after the successful completion of commissioning. These facilities include office trailers, temporary storage facilities and assembly areas. In addition, all construction debris and equipment will be removed as part of the site demobilization. Any temporary areas will be restored as required by the final project design.

Construction Equipment

The equipment that is likely to be required to install the new overhead transmission line and converter station components is summarized by construction stage in Table 2.6-1.

Use of helicopters for certain activities may produce construction efficiencies. Coordination with the appropriate local, state, and federal agencies will occur to support the use of helicopter construction should the need arise. Generally, the use of helicopters would allow for additional efficiencies during wire stringing activities and allow manpower, materials, and equipment to be spotted in difficult to reach places that may only be accessible via ground line techniques at certain times of year or in instances where ground line access is not feasible.

Table 2.6-1: Typical Equipment and Materials to be used for GSPL Project Construction		
Construction Phase	**Typical Equipment/Materials Required**	
Removal of Vegetation & ROW Mowing in Advance of Construction	Grapple Trucks Truck Mounted Mowers Chippers Log Forwarders Box Trailers Low-Bed Trailers/Flatbeds	Brush Hogs Skidders Bucket Trucks Motorized Tree Shears Chain Saws Bulldozers & Excavators Pick-Up Trucks
Erosion/Sediment Controls	Rack Trucks Pick-Up Trucks	Small Excavators Trenchers
Access Road Improvement & Maintenance	Dump Trucks Bulldozers Excavators Backhoes Front End Loaders	Graders Cranes Pick-Up Trucks Low-Bed Trailers Rack Trucks
Installation of Foundations & Structures	Backhoes Bulldozers Front-End Loaders ATVs Tracked carriers Skid Steer Concrete Trucks Grout Hoppers Rock Hammers Rock Drills Cranes	Aerial Lift Equipment Bucket Trucks Dump Trucks Generators Air Compressors Pumps Vibratory Tampers Tractor Trailers Excavators Large Bore Foundation Drill Rigs
Installation of Conductor, OPGW & Shield Wire	Bucket Trucks Puller-Tensioners Conductor Reel Stands Helicopter/UAVs Boom Trucks/Batwings	Cranes Tracked carriers Skid Steer Pick-Up Trucks ATVs
Restoration of the ROW	Pick-Up Trucks Excavators Backhoes Bulldozers Rock Hounds	Dump Trucks Tractor Mounted York Rakes Straw blowers Hydro-seeders

2.7 STAGING AREAS

The staging areas for the converter stations (referred to herein as Construction Design Management Areas or "CDM") will occupy approximately 5 acres at both the Norton Converter Station and the Monroe Converter Station sites. These CDMs will feature an improved surface, such as crushed stone, with mobile office space to support construction and technical field personnel operations, material staging, and equipment storage.

The GSPL Line will require multiple staging areas along the length of the ROW. These staging areas will be located off-ROW and utilized for material and equipment storage, work force parking, and field offices. These areas will generally consist of existing open areas 5 to 7 acres in size and be located in previously disturbed areas, to the extent possible. The use of previously disturbed areas will allow for minimal impact to the environment or community in which the staging area is located. The selection of locations for staging areas will be dependent upon a number of variables including proximity to residential areas, sufficient size to support necessary material and equipment storage, proximity to the Project ROW, accessibility for material and equipment delivery, ability to restrict site access, amount of ground improvement necessary to establish the staging area, and proximity to sensitive environmental resources.

Construction BMPs will be applied to all staging areas consistent with state and federal requirements to ensure no sediment or erosion from marshalling yards occurs onto public ways or into any jurisdictional wetlands or water bodies. Selection of staging areas will also consider impacts to local traffic and weight restrictions on local roads. Only those staging areas that have received the necessary reviews and approvals will be used during construction of the project.

Staging areas will also be located within the Project ROW and used for temporary staging of materials and timber matting prior to installation. Laydown areas may also be used for equipment staging when the equipment is not in use. Candidate laydown areas will be located in upland areas in relatively level locations.

2.8 OPERATIONS & MAINTENANCE

GridAmerica will oversee the asset management, engineering, regulatory, environmental, legal, accounting, finance, procurement, contract management, safety and risk mitigation services for the Operation and Maintenance ("O&M") of the Project. The O&M services will be provided by a fully qualified mix of GridAmerica staff, contractors, sub-contractors, original equipment manufacturer technicians, and consultants. GridAmerica, through its affiliation with National Grid, has access to extensive experience in preventative and predictive maintenance and testing programs.

The O&M program for the GSPL Line will be designed to be consistent with these programs, industry standards and best utility practices. Where applicable, the O&M practices will meet the requirements of the NPCC, NERC, interconnecting utilities, and independent system operators ("ISOs"). Typically, these programs include aerial visual inspection of all assets on a bi-annual basis with ground line inspections occurring every five years. Additionally, maintenance of the converter facilities will be performed in accordance with the manufacturers' requirements and recommendations. GSPL will store an inventory of spare parts at supply depots to allow for prompt response for maintenance activities.

The GSPL transmission facilities will have the ability to be operated from either of the converter stations or from a remote location. Dispatching of the Project active power levels will be at the direction of the ISO-NE. Transmission facilities planned and unplanned outages will be coordinated with both the interconnecting utilities and ISO-NE.

3.0 INFORMATION REGARDING POTENTIAL ENVIRONMENTAL IMPACTS

The information obtained and presented in Section 3.0 is from readily available public documents and sources. Mapping and associated quantification of environmental features crossed, within or adjacent to the project is based on publically available Geographic Information System databases and datalayers. Field work commenced in the Fall of 2017 and is ongoing and will continue into 2018. As resource and environmental information derived from field work efforts becomes available, supplemental filings will be made as needed to revise, amend, or add to the characterization of project area environmental resources. As with any development project, as efforts are undertaken to obtain project specific information, it is possible that the new information will differ from that obtained from publically available sources.

3.1 RIGHT-OF-WAY REQUIREMENTS

The ROW width required to support the GSPL Line is based on a minimum centerline separation requirement from the existing Quebec–New England HVDC line of 150 feet. The width from the centerline of the GSPL Line to the edge of ROW considered wind on wire effects, constructability, operations and maintenance requirements, mitigation of risk due to vegetation related outages, and high level electric and magnetic field considerations. A minimum clearance to ground distance ranging from 23 feet to 38 feet is required.

3.2 GEOLOGY AND SOILS

3.2.1 Environmental Setting

The GSPL Line will traverse a topography of gentle to moderate slopes, with occasional steep slopes of greater than 25 percent. Topography ranges from high elevations of 1,500 to 1,720 at the Norton Converter Station to an elevation of 850 feet at the Monroe Converter Station. Most of the soils along the GSPL Line are not prime farmland and are derived from the underlying lodgement, basal, and ablation tills [NRCS 2017]. The thin tills present along the route mantle the bedrock surface and reflect the topography of the underlying bedrock surface. The till is thicker in the valleys, thinner in the uplands, with many upland locations eroded away and exposing the bedrock surface. The thickness of the till is typically 0-5 feet, with localized thicknesses of greater than 25 feet.

With much of the route occurring in upland areas associated with ridges and slopes, the occurrence of deeper organic and muck soils is generally limited to near stream and river valley areas, or low-lying areas with wetlands. These types of soils occur along less than 1 percent of the route. Alluvial soils associated with floodplains are minimal along most of the route, until the final 0.7 miles of the route where glacial outwash is present on the east side of the Connecticut River. The bedrock along the GSPL Line primarily consists of granite and metamorphosed quartzite, schist, tonalite, metafelsite, and metasiltstone.

Table 3.2-1 lists soil types along the GSPL ROW and Table 3.2-2 provides that information for the proposed converter station sites.

Table 3.2-1: Soil Types Crossed by the GSPL Line				
State	**Map Unit Symbol**	**Soil Name**	**Parent Material**	**Crossing Length (feet)**
VT	SIE8	Wonsqueak, Pondicherry, and Bucksport mucks, 0 to 2 percent slopes	organic material over loamy till	1021
VT	50A	Wonsqueak and Pondicherry mucks, 0 to 2 percent slopes	organic material over loamy till	527
VT	SIE21	Wilmington-Colonel complex, 0 to 8 percent slopes, very stony	loamy basal till	15496
VT	W	Water	till	411
VT	214C	Vershire-Lombard complex, 8 to 15 percent slopes, very stony	loamy till	153
VT	214D	Vershire-Lombard complex, 15 to 35 percent slopes, very stony	loamy till	607
VT	56D	Vershire-Glover complex, 15 to 35 percent slopes, very rocky	loamy till	2399
VT	104E	Urban land-Adams-Nicholville complex, 25 to 60 percent slopes	till	408
VT	SIE41	Tunbridge-Peru-Wilmington complex, 0 to 8 percent slopes, very stony	loamy till	8625
VT	SIE43	Tunbridge-Peru-Colonel complex, 15 to 35 percent slopes, very stony	loamy till	9737
VT	SIE44	Tunbridge-Peru complex, 35 to 60 percent slopes, very stony	loamy till	292
VT	SIE52	Tunbridge-Lyman complex, 8 to 15 percent slopes, very rocky	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	6618
VT	SIE54	Tunbridge-Lyman complex, 35 to 60 percent slopes, very rocky	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	4372
VT	SIE53	Tunbridge-Lyman complex, 15 to 35 percent slopes, very rocky	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	10047
VT	SIE42	Tunbridge-Colonel-Cabot complex, 8 to 15 percent slopes, very stony	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from granite and/or loamy lodgment till derived from phyllite	17342
VT	SIE61	Sunapee-Moosilauke complex, 0 to 8 percent slopes, very stony	sandy and gravelly ablation till	5107
VT	SIE33	Peru-Colonel complex, 15 to 35 percent slopes, very stony	loamy basal till	44343
VT	SIE60	Moosilauke very fine sandy loam, 0 to 8 percent slopes, very stony	sandy and gravelly ablation till	668
VT	SIE62	Monadnock-Sunapee-Colonel complex, 8 to 15 percent slopes, very stony	sandy and gravelly ablation till	12405
VT	SIE63	Monadnock-Sunapee complex, 15 to 35 percent slopes, very stony	sandy and gravelly ablation till	9125
VT	SIE64	Monadnock fine sandy loam, 35 to 60 percent slopes, very stony	sandy and gravelly ablation till	1205
VT	75D	Monadnock fine sandy loam, 15 to 35 percent slopes, very stony	sandy and gravelly ablation till	588
VT	17D	Dummerston very fine sandy loam, 15 to 35 percent slopes, very stony	loamy till	1587
VT	32E	Colton-Duxbury complex, 25 to 60 percent slopes	sandy and gravelly glaciofluvial deposits	426

Table 3.2-1: Soil Types Crossed by the GSPL Line				
State	**Map Unit Symbol**	**Soil Name**	**Parent Material**	**Crossing Length (feet)**
VT	32D	Colton-Duxbury complex, 15 to 25 percent slopes	sandy and gravelly glaciofluvial deposits	473
VT	SIE32	Colonel-Peru complex, 8 to 15 percent slopes, very stony	loamy basal till	1228
VT	SIE12	Cabot-Colonel complex, 8 to 15 percent slopes, very stony	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	83867
VT	SIE12N	Cabot-Colonel complex, 8 to 15 percent slopes	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	1102
VT	23C	Cabot silt loam, 8 to 15 percent slopes, very stony	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	1580
VT	SIE11	Cabot silt loam, 0 to 8 percent slopes, very stony	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	29771
VT	23B	Cabot silt loam, 0 to 8 percent slopes, very stony	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	229
VT	21C	Buckland loam, 8 to 15 percent slopes, very stony	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone and/or loamy lodgment till derived from phyllite	4269
VT	20C	Buckland loam, 8 to 15 percent slopes	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone and/or loamy lodgment till derived from phyllite	303
NH	W	Water		838
NH	61E	Tunbridge-Lyman-Rock outcrop complex, 25 to 60 percent slopes	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	2838
NH	61D	Tunbridge-Lyman-Rock outcrop complex, 15 to 25 percent slopes	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	732
NH	647B	Pillsbury fine sandy loam, 0 to 8 percent slopes, very stony	loamy lodgment till derived from gneiss and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from granite	3379
NH	79C	Peru fine sandy loam, 8 to 15 percent slopes, very stony	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	6246
NH	78B	Peru fine sandy loam, 3 to 8 percent slopes	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	721
NH	79D	Peru fine sandy loam, 15 to 25 percent slopes, very stony	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	852
NH	79B	Peru fine sandy loam, 0 to 8 percent slopes, very stony	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	5038
NH	255E	Monadnock and Hermon soils, 25 to 35 percent slopes, very stony	till	260
NH	255D	Monadnock and Hermon soils, 15 to 25 percent slopes, very stony	till	256

Table 3.2-1: Soil Types Crossed by the GSPL Line				
State	**Map Unit Symbol**	**Soil Name**	**Parent Material**	**Crossing Length (feet)**
NH	77C	Marlow fine sandy loam, 8 to 15 percent slopes, very stony	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	516
NH	76C	Marlow fine sandy loam, 8 to 15 percent slopes	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	1001
NH	77E	Marlow fine sandy loam, 25 to 50 percent slopes, very stony	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	365
NH	77D	Marlow fine sandy loam, 15 to 25 percent slopes, very stony	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	2179
NH	28A	Madawaska fine sandy loam, 0 to 3 percent slopes	loamy outwash over sandy and/or gravelly outwash derived from granite and gneiss or schist	303
NH	347B	Lyme and Moosilauke soils, 3 to 8 percent slopes, very stony	till	352
NH	27C	Groveton fine sandy loam, 8 to 15 percent slopes	loamy outwash over sandy and/or gravelly outwash derived from granite and gneiss or schist	317
NH	27B	Groveton fine sandy loam, 3 to 8 percent slopes	loamy outwash over sandy and/or gravelly outwash derived from granite and gneiss or schist	150
NH	295	Greenwood mucky peat	herbaceous organic material and/or woody organic material	692
NH	613	Croghan loamy fine sand	sandy outwash derived mainly from granite, gneiss and schist	216
NH	22B	Colton loamy sand, 3 to 8 percent slopes	stratified sandy and gravelly outwash derived from granite and gneiss	11
NH	22E	Colton loamy sand, 15 to 60 percent slopes	stratified sandy and gravelly outwash derived from granite and gneiss	117
NH	22A	Colton loamy sand, 0 to 3 percent slopes	stratified sandy and gravelly outwash derived from granite and gneiss	392
NH	73C	Berkshire loam, 8 to 15 percent slopes, very stony	till	367
NH	72B	Berkshire loam, 3 to 8 percent slopes	till	197
NH	73D	Berkshire loam, 15 to 25 percent slopes, very stony	till	741
NH	36C	Adams loamy sand, 8 to 15 percent slopes	sandy outwash derived mainly from granite, gneiss and schist	479
NH	36B	Adams loamy sand, 3 to 8 percent slopes	sandy outwash derived mainly from granite, gneiss and schist	1724
NH	36E	Adams loamy sand, 15 to 60 percent slopes	sandy outwash derived mainly from granite, gneiss and schist	3944
			Total:	**311551**

Table 3.2-2: Soil Types at the Proposed GSPL Converter Stations			
Town	**State**	**Soil Type**	**Parent Material**
NORTON	VT	Cabot-Colonel complex	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone
NORTON	VT	Peru-Colonel complex	loamy basal till
NORTON	VT	Tunbridge-Colonel-Cabot complex	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from granite and/or loamy lodgment till derived from phyllite
NORTON	VT	Tunbridge-Peru-Wilmington complex	loamy till
MONROE	NH	Marlow fine sandy loam	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite
MONROE	NH	Peru fine sandy loam	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite

3.2.1 Impacts and Mitigation

The shallow till and competent underlying bedrock within the GSPL ROW will support concrete pad foundations or concrete caisson foundations without amendments or improvements. To the extent practical, steep slope locations along the ROW will be avoided or may require some level of specialty construction methods. Soils at converter station sites tend to be sufficiently deep to allow for avoidance of bedrock during construction.

GridAmerica will develop sediment and erosion control plans to support each excavation at the structure and converter station locations, utilizing BMPs. Site specific plans may include silt fence, straw bales, berms, and benching. Disturbed areas will be stabilized and restored, including temporary and permanent re-seeding.

No significant Project-related impacts to soils or geologic resources are anticipated from construction and operation of the Project.

3.3 WATER RESOURCES INCLUDING NAVIGABLE WATERWAYS

3.3.1 Environmental Setting

The Project route in Vermont crosses three Vermont Agency of Natural Resources ("VANR") designated major river basins: the Lake Memphremagog, Tomifobia and Coaticook Basin (Basin 17), the Upper Connecticut River Basin (Basin 16), and the Passumpsic River Basin (Basin 15) [USGS 2017].

The northernmost 5.07-mile segment of the Project ROW is located within Basin 17, more specifically within the basin's easternmost watershed, the Coaticook River Watershed. The Coaticook River originates at the outlet of Norton Pond and flows northeasterly for over 6 miles passing just west of Norton and into Canada. Tributaries in the U.S. include Station Brook, Sutton Brook, Davis Brook, Gaudette Brook, Moser Meadow Brook, Number Five and Number Six Brooks, and Averill Creek which drains Great and Little Averill ponds. Vermont portions of the Coaticook River Watershed cover 66 square miles. The Coaticook River Watershed falls under Basin 17 Lake Memphremagog, Tomifobia and Coaticook Tactical Basin Plan [VANR 2017] and the associated Basin 17 Water Quality Management Plan [VANR 2012]. Water quality in the Coaticook River Watershed is generally good, although water levels and water quality in the

Coaticook River and Averill Brook can be affected by flow modifications associated with dams at Norton Pond and the Averill ponds which are managed by Hydro Coaticook under Vermont Public Utility Commission regulations [VANR 2012]. None of the streams crossed by the GSPL ROW in the Basin 17 area have been identified as impaired waters in the State of Vermont's 2016 303(d) list of impaired waters.

The majority (40.52 miles) of the remaining GSPL ROW in Vermont is located within Basin 16, Upper Connecticut River Basin. Basin 16 consists of the northern Connecticut River and direct tributaries to it from the Canadian border down to White River Junction and drains 482 square miles in Vermont. The GSPL Line crosses four Basin 16 sub-watersheds including the Nulhegan River Watershed, the Paul Stream-Connecticut River Watershed, the Cutler Mill Brook-Connecticut River Watershed, and the Stevens River-Connecticut River Watershed. Basin 16 falls under the Passumpsic and Upper Connecticut River Tactical Basin Plan [VANR 2014] and an associated Basin 16 Water Resources, Water Quality and Aquatic Habitat Assessment Report [VANR 2011]. Basin 16 is primarily a forested watershed (> 77 percent of land cover is forest) and water quality is good [VANR 2011]. None of the streams crossed by the Project route in the Basin 16 area have been identified as impaired water in the State of Vermont's 2016 303(d) list of impaired waters.

A 6.84-mile segment of the GSPL Line (traversing sections of the towns of Granby, Victory and Lunenburg) is located within Basin 15, the Passumpsic River Basin. Basin 15 drains 507 square miles in Vermont, including a major portion of Caledonia County and minor portions of Essex, Orleans and Washington counties. Within Basin 15, the Project route crosses Moose River Watershed. Basin 15 falls under the Passumpsic and Upper Connecticut River Tactile Basin Plan [VANR 2014] and the associated Passumpsic River Watershed Water Quality and Aquatic Habitat Assessment Report [VANR 2009]. Water quality in the Moose River Watershed is good [VANR 2009]. None of the streams crossed by the Project ROW in the Moose River Watershed have been identified as impaired water in the State of Vermont's 2016 303(d) list of impaired waters.

The VANR classifies all surface waters in Vermont as either Class A or Class B. The January 15, 2017 Water Quality Standards recognize two categories of Class A waters. Class A waters are subdivided into Class A(1) Ecological Waters and Class A(2) Public Water Supplies. Class A(1) waters are managed to maintain waters in a natural condition and Class A(2) waters are managed as public water supplies and therefore allow moderate water level fluctuation. Class B waters represent all other waters and are designated as being either Water Management Type 1, 2, or 3 depending upon their protection and management, with 1 being the most protective of the three. Outstanding Resource Water ("ORW") may overlay both Class A and Class B waters. These waters are designated by the VANR as having exceptional natural, recreational, cultural, or scenic value. None of the waters crossed by the GSPL Line are designated ORWs.

Presently, in all basins across Vermont, waters above 2,500 elevation are classified as A (1) by Vermont statute. Most waters in the Northeast Kingdom, like in the rest of Vermont, are Class B, which is consistent with State policy to achieve and maintain Class B waters with suitability for swimming, boating, and drinking with treatment as well as for irrigation and livestock watering. All waters crossed along the GSPL ROW are Class B.

As shown in Table 3.3-1 and in Figure 3.3-1 (in Exhibit F), the proposed GSPL Line centerline in Vermont crosses 64 waterbodies included in the National Hydrography Dataset, including 16 named streams and 2 waterbodies considered navigable waters of the U.S. as defined in 33 C.F.R. Part 329 (Nulhegan River and Paul Stream). Note that at the Connecticut River crossing location, the state boundary is located at the low water mark on the northern (Vermont) site of the river and the river is considered entirely within the State of New Hampshire.

Table 3.3-1: Waterbodies Crossed by GSPL Line in Vermont			
Waterbody Name	**Watershed**	**Flow Regime**	**Navigable Water (per USACE)**
Unnamed	Coaticook River	Perennial	No
Unnamed	Coaticook River	Perennial	No
Unnamed	Coaticook River	Perennial	No
Unnamed	Coaticook River	Perennial	No
Averill Creek	Coaticook River	Perennial	No
Unnamed Tributary to Number Six Brook	Coaticook River	Perennial	No
Unnamed Tributary to Number Six Brook	Coaticook River	Perennial	No
Unnamed Tributary to Number Six Brook	Coaticook River	Perennial	No
Unnamed Tributary to Number Six Brook	Coaticook River	Perennial	No
Unnamed Tributary to Number Six Brook	Coaticook River	Perennial	No
Unnamed Tributary to Number Six Brook	Coaticook River	Perennial	No
Unnamed Tributary to Number Six Brook	Coaticook River	Perennial	No
Unnamed Tributary to Number Six Brook	Coaticook River	Perennial	No
Number Six Brook	Coaticook River	Perennial	No
Unnamed Trib. to Black Branch Nulhegan River	Nulhegan River	Perennial	No
Unnamed Trib. to Black Branch Nulhegan River	Nulhegan River	Perennial	No
Unnamed Trib. to Black Branch Nulhegan River	Nulhegan River	Perennial	No
Unnamed Trib. to Black Branch Nulhegan River	Nulhegan River	Perennial	No
Unnamed Trib. to Black Branch Nulhegan River	Nulhegan River	Perennial	No
Unnamed Trib. to Black Branch Nulhegan River	Nulhegan River	Perennial	No
Unnamed Trib. to Black Branch Nulhegan River	Nulhegan River	Perennial	No
Unnamed Trib. to Black Branch Nulhegan River	Nulhegan River	Perennial	No
Nulhegan River	Nulhegan River	Other	Yes
Unnamed Tributary to Nulhegan River	Nulhegan River	Perennial	No
Unnamed Tributary to Nulhegan River	Nulhegan River	Perennial	No
Unnamed Tributary to Notch Pond Brook	Paul Stream – CT River	Perennial	No
Notch Pond Brook	Paul Stream – CT River	Perennial	No
Paul Stream	Paul Stream – CT River	Perennial	Yes
Unnamed Tributary to Paul Stream	Paul Stream – CT River	Perennial	No
Paul Stream	Paul Stream – CT River	Perennial	Yes
Unnamed Tributary to Paul Stream	Paul Stream – CT River	Perennial	No
Madison Brook	Paul Stream – CT River	Perennial	No
Fitch Brook	Paul Stream – CT River	Perennial	No
Unnamed Tributary to Fitch Brook	Paul Stream – CT River	Perennial	No
Unnamed Tributary to Fitch Brook	Paul Stream – CT River	Perennial	No
Unnamed Tributary to Stony Brook	Paul Stream – CT River	Perennial	No
Stony Brook	Paul Stream – CT River	Perennial	No
Unnamed Tributary to Tolman Brook	Paul Stream – CT River	Perennial	No
Tolman Brook	Paul Stream – CT River	Perennial	No
Unnamed Tributary to Wilke Brook	Paul Stream – CT River	Perennial	No
Wilke Brook	Paul Stream – CT River	Perennial	No

Table 3.3-1: Waterbodies Crossed by GSPL Line in Vermont			
Waterbody Name	**Watershed**	**Flow Regime**	**Navigable Water (per USACE)**
Pond Brook	Moose River	Perennial	No
Suitor Brook	Moose River	Perennial	No
Unnamed Tributary to Rogers Brook	Moose River	Perennial	No
Unnamed Tributary to Rogers Brook	Moose River	Perennial	No
Unnamed Tributary to Hay Hill Brook	Moose River	Perennial	No
Unnamed Tributary to Hay Hill Brook	Moose River	Perennial	No
Unnamed Tributary to Hay Hill Brook	Moose River	Perennial	No
Unnamed Tributary to Carr Brook	Cutler Mill Bk. – CT River	Perennial	No
Unnamed Tributary to Carr Brook	Cutler Mill Bk. – CT River	Perennial	No
Carr Brook	Cutler Mill Bk. – CT River	Perennial	No
Carr Brook	Cutler Mill Bk. – CT River	Perennial	No
Carr Brook	Cutler Mill Bk. – CT River	Perennial	No
Unnamed Tributary to Carr Brook	Cutler Mill Bk. – CT River	Perennial	No
Miles Stream	Cutler Mill Bk. – CT River	Perennial	No
Unnamed Tributary to Roaring Brook	Stevens River – CT River	Perennial	No
Roaring Brook	Stevens River – CT River	Perennial	No
Unnamed Tributary to Roaring Brook	Stevens River – CT River	Perennial	No
Unnamed Tributary to Roaring Brook	Stevens River – CT River	Perennial	No
Unnamed Tributary to Connecticut River	Stevens River – CT River	Perennial	No
Moore Reservoir-Connecticut River	Stevens River – CT River	Other	No
Unnamed Tributary to Connecticut River	Stevens River – CT River	Perennial	No
Halls Brook	Stevens River – CT River	Perennial	No
Unnamed Tributary to Connecticut River	Stevens River – CT River	Other	No

The proposed GSPL Line crosses into New Hampshire at the low water mark on the northern side of the Connecticut River just below the Moore Dam in an area known as the Riverbend segment. The portion of the Project located in New Hampshire is generally parallel to the irregular shoreline of the Comerford Dam Reservoir, which was created with the impoundment of the Connecticut River by the Comerford Dam, currently owned and operated as a hydroelectric facility by Great River Hydro, LLC.

As shown in Table 3.3-2 and in Figure 3.3-1, the Project ROW in New Hampshire crosses the Comerford Dam Reservoir Watershed, a 1.7 square mile watershed that is part of the larger Stevens River – Connecticut River Basin. In addition to crossing the Connecticut River/Comerford Dam Reservoir, the portion of the GSPL Project in New Hampshire crosses seven streams included in the National Hydrography Dataset, including three named streams; only the Connecticut River is considered navigable.

Table 3.3-2: Waterbodies Crossed by GSPL Line in New Hampshire			
Waterbody Name	**Watershed**	**Flow Regime**	**Navigable Water (per USACE)**
Connecticut River	Comerford Dam Reservoir	Other	Yes
Unnamed Tributary to Connecticut River	Comerford Dam Reservoir	Perennial	No
Unnamed Tributary to Connecticut River	Comerford Dam Reservoir	Intermittent	No

Table 3.3-2: Waterbodies Crossed by GSPL Line in New Hampshire			
Waterbody Name	**Watershed**	**Flow Regime**	**Navigable Water (per USACE)**
Bill Little Brook	Comerford Dam Reservoir	Perennial	No
Unnamed Tributary to Connecticut River	Comerford Dam Reservoir	Intermittent	No
Unnamed Tributary to Connecticut River	Comerford Dam Reservoir	Intermittent	No
Carter Brook	Comerford Dam Reservoir	Perennial	No
Scarritt Brook	Comerford Dam Reservoir	Perennial	No

In addition to its status as a navigable river, the New Hampshire Department of Environmental Services ("NHDES") has classified the Connecticut River as a State Designated River under New Hampshire Rivers Management and Protection Program ("RMPP"). The RMPP was established by the New Hampshire legislature in 1988 with intent of protecting and conserving certain rivers and river segments, referred to as State Designated Rivers, in acknowledgement of their outstanding natural and cultural resources. The RMPP provides certain instream protection measures for State Designated Rivers and establishes a river classification system that matches general river characteristics of a river segment with specific protection measures. State and local river management committees established under the RMPP will play a project review and advisory role in state assessment of development proposals such as the GSPL Project.

In addition to administering the RMPP, NHDES also administers New Hampshire's Surface Water Quality Standards. As an aspect of water quality and designated uses in New Hampshire, NHDES classifies surface waters of the State as either Class A or Class B. Class A waters are considered to be of the highest quality and considered optimal for use as water supplies after adequate treatment. Discharge or sewage or other wastes into Class A waters is prohibited. Class B waters are considered acceptable for fishing, swimming, and other recreational purposes, and for use as water supplies after adequate treatment has been applied. New Hampshire's surface water quality standards, including water quality criteria for surface water designated classification, cannot be violated as a result of the proposed project, and it is anticipated that this will be documented through the federal National Pollutant Discharge Elimination System ("NPDES") permit process and the state's Water Quality Certification under section 401 of the federal Clean Water Act. The waters noted above that are crossed by the GSPL Line are designated as Class B waters. The construction and operation of the proposed Project and any related discharges to surface waters will not add any pollutants contributing to impairment and will be designed to comply with state surface water quality standards and any related conditions applicable to the Class B designation of the receiving surface waters.

The Connecticut River at Littleton is listed as an impaired water in the draft 2016 New Hampshire 303(d) list of impaired waters. Specifically, the river is assigned an impairment categorization of 5-M for pH parameters, with the source of the impairment indicated as unknown. Parameters listed with a 5-M categorization require a Total Maximum Daily Load ("TMDL") evaluation, however, the impairment is considered marginal and the TMDL priority is listed as low. All fresh water surface waters in New Hampshire have an identified impairment for fish consumption from elevated mercury associated with atmospheric deposition and are subject to the Northeast Regional Mercury TMDL for mercury impairment.

3.3.2 Impacts and Mitigation

A key objective of Project route selection, design and construction is to minimize impacts to rivers, streams and navigable waters crossed by the Project. The GSPL Line will be constructed in an overhead configuration, and impacts on surface waters will be minimized because transmission line structures can generally be located to avoid direct impact on surface waters while also maintaining a vegetative buffer

along stream banks. Use of existing access roads and existing stream crossings to the greatest extent practicable for construction and maintenance will also minimize impacts to water resources.

Where the ROW crosses streams and brooks, vegetation along the stream bank will be selectively cut to minimize the disturbance of bank soils and the potential for construction-related erosion. In environmentally sensitive areas, hand cutting and low ground pressure equipment will be utilized to the greatest extent practicable to minimize potential impacts. Erosion and sediment control devices such as straw bales, siltation fencing, and/or chip bales will be installed in accordance with approved plans and permit requirements. The erosion and sediment controls will be installed between the work area and environmentally sensitive areas such as wetlands, streams, as well as drainage courses, roads, and adjacent properties when work activities will disturb soils and result in a potential for erosion and sedimentation. The devices will be monitored regularly and will function to mitigate construction-related erosion and sedimentation, and will also serve as a physical boundary to delineate resource areas and to contain construction activities within approved areas. Appropriate erosion and sediment control measures will also be implemented at converter station construction sites and at staging areas for the converter stations and along the Project route.

Implementation of an approved SPCCP during Project construction will ensure that oils, lubricants, fuels and other chemicals are appropriately handled and stored and will minimize the potential for releases to sensitive resource areas, such as wetlands and streams. The SPCCP will include detailed requirements for containment and cleanup equipment and procedures, refueling procedures, and storage of bulk quantities of petroleum products and chemicals, which will serve to minimize the potential for and minimize the impact of a release, should one occur.

Existing access roads will be used to the extent possible. Maintenance or upgrades to the existing access roads may be required at some locations and could include placement of clean gravel or trap rock to stabilize and level the roads for construction vehicles. Road spurs will likely be constructed at certain locations to provide access from the existing ROW access roads. Stream crossings for access roads will be assessed to determine if an upgrade of the existing culvert or other crossing measure upgrades are required to support construction and minimize potential for erosion, sedimentation or other impacts to surface waters.

Dewatering may be necessary during excavations or concrete pouring for foundations. At all times, dewatering will be performed in compliance with BMPs that are consistent with established BMPs used by utilities operating in Vermont and New Hampshire and applicable permitting requirements. Sediment generated during dewatering activities will be collected in a dewatering basin to minimize the potential for discharge of sediment to surface waters. The dewatering basin and all accumulated sediment will be removed following dewatering operations and the area will be seeded and mulched.

Construction and operation of the GSPL converter stations in Vermont and New Hampshire will be performed in accordance with applicable state (Vermont) and federal (New Hampshire) NPDES stormwater permits.

Foundations installed to support Project structures will result in a minor increase in impervious area along the Project route as compared with pre-construction conditions. This minor increase in impervious area, to be quantified during Project design, is not anticipated to result in any meaningful increase in stormwater runoff for the operational Project. The increase in impervious area resulting from the footprint of buildings and other structures at the proposed converter stations will also be quantified during Project design and is expected to be greater in relative magnitude than that along the Project ROW. At the converter stations permanent stormwater management measures will be designed, permitted, and implemented to manage stormwater runoff and meet state water quality standards

3.4 WETLANDS, VERNAL POOLS AND FLOODPLAINS

3.4.1 Environmental Setting

Wetlands

Wetland delineation field work commenced in the fall of 2017 and GridAmerica anticipates completing field wetland delineations along the proposed ROW in the second quarter of 2018. For this Presidential Permit application, GridAmerica reviewed available National Wetlands Inventory ("NWI") data to estimate potential impacts and Project constraints due to the presence of NWI wetlands along the proposed GSPL Line. Based on a review of the NWI, a total of approximately 1.42 miles of mapped wetlands will be crossed by the GSPL Line. Table 3.4-1 presents the Cowardin wetland classification and the linear crossing distance of each classification crossed by the proposed ROW expansion for the GSPL Line. Note that crossing lengths for streams is a preliminary estimate, and refined data will be available following completion of field work. Also of note is that of the 80 NWI wetland crossings, 66 are waterways (riverine or lacustrine) and only 14 are vegetated wetlands.

Table 3.4-1: NWI Wetland Types and Crossing Lengths within the GSPL ROW in Vermont and New Hampshire

Wetland Classification	Total Length of Wetlands Crossed (miles)		
	Vermont	New Hampshire	Total
Riverine	0.39	0.03	0.42
Palustrine Forested	0.43	-	0.43
Palustrine Scrub/Shrub	0.15	-	0.15
Freshwater Emergent	0.22	-	0.22
Lake	0.05	0.16	0.21
Total	**1.23**	**0.19**	**1.42**

A total of approximately 6,494 feet (1.23 miles) of NWI mapped wetlands will be crossed by the GSPL Line in Vermont. No NWI mapped wetlands occur within the boundary of the proposed Norton Converter Station site.

A total of 1,003 feet (0.19 miles) of NWI mapped wetlands will be crossed by the GSPL Line in New Hampshire. No NWI mapped wetlands occur within the boundaries of the proposed Monroe Converter Station site.

Figure 3.4-1 in Exhibit F shows NWI wetlands crossed and in the vicinity of the proposed GSPL Line.

Vernal Pools

No state or federally mapped vernal pools are crossed by the proposed GSPL Line. Because of their seasonal nature, the identification of vernal pools requires a project-specific survey usually during the months of April and May in accordance with agency-approved protocols. GridAmerica anticipates conducting vernal pool surveys in spring 2018 to confirm the presence or absence of regulated vernal pools within the Project boundaries. For this Presidential Permit application, GridAmerica has included a general discussion of vernal pools.

Vernal pools occur within seasonally flooded forested wetlands that generally develop within small depressions typically underlain by an impermeable subsurface layer such as till, hardpan or bedrock. Generally, these pools are fed by spring runoff, snow melt or groundwater sources and attain a maximum depth of less than four (4) feet during the fall and spring. Vegetation is sparse and typical vegetation associated with vernal pools includes sensitive fern (*Onoclea sensibilis)*, marsh fern (*Thelypteris palustris*), rice cutgrass (*Leersia oryzoides),* and northern bugleweed (*Lycopus uniflorus),* Vernal pools characteristically lack established fish populations which make them optimal and critical habitat for breeding amphibians and invertebrates due to decreased predation. Wood frog (*Lithobates sylvaticus),* spring peeper (*Pseudacris crucifer),* spotted salamander (*Ambystoma maculatum),* Jefferson's salamander (*Ambystoma jeffersonianum*), blue spotted salamander (*Ambystoma laterale*), and red spotted newt (*Notophthalmus viridescens*) are some of the species known to regularly utilize vernal pools for breeding. Additionally, vernal pools are important habitat for invertebrate species such as fairy shrimp, fingernail clams, backswimmers, copepods, seed shrimp, and dragonfly nymphs [Thompson 2000].

The U.S. Army Corps of Engineers ("USACE") regulates vernal pools of both natural and non-natural origin. Additionally, the USACE regulates the terrestrial habitat around certain pools to a distance of 750 feet from the upper limit of the depression. Consultation with the USACE and U.S. Fish and Wildlife Service ("USFWS") is required (generally on a case-by-case basis) to determine USACE jurisdiction over identified vernal pools that may be impacted within the Project area. GridAmerica is continuing ongoing discussions with the USACE and plans to complete more detailed coordination in the coming months following the completion of the spring 2018 delineations.

Vermont Wetland Rules ("VWR") protect habitat that supports the reproduction and breeding populations of Vermont's uncommon amphibians and reptiles. Wetlands that provide amphibian breeding habitat and have no permanent inlet or viable populations of fish are considered vernal pools which are considered to be significant (VWR Class II) wetlands. When activities are proposed within 50 feet of a pooling wetland, an evaluation of the extent that the wetland supports reproduction or provides habitat to uncommon pool-breeding Vermont amphibian species is required as part of the Vermont Department of Environmental Conservation ("VDEC") wetland permitting review. This evaluation cannot take place unless spring breeding and habitat condition information is available and this information can only be obtained through field surveys during the spring season when vernal pools are present and available for breeding.

The NHDES Wetland Rules (New Hampshire Code of Administrative Rules, Envt-Wt 100-900) require that any applicant applying to fill or dredge within state wetlands, locate and delineate vernal pools and consider the impact of the proposed project on vernal pools.

Floodplains

Flood plain areas have been identified by the Federal Emergency Management Agency ("FEMA") to help identify high-risk flood plains throughout the country. The FEMA maps identify Special Flood Hazard Areas and are used by the National Flood Insurance Program ("NFIP") to determine where the NFIP's floodplain management regulations must be enforced and flood insurance requirements apply.

The Vermont portion of the GSPL Line crosses and/or spans a combined total of 0.65 linear miles of FEMA mapped flood hazard areas.

In New Hampshire, the proposed GSPL Line crosses a combined total of 0.15 linear miles of floodplain in two FEMA-mapped Zone A flood hazard areas associated with the Connecticut River and Bill Little Brook (Zone A is defined as areas with a 1 percent annual chance of flooding; no depths or base flood elevations are shown within these zones).

Wherever practicable, the transmission line will span floodplains, and staging areas and roadways will avoid the floodplain area. If structures or temporary construction areas are required within the floodplain area, GridAmerica will work to minimize potential impacts.

3.4.2 Impacts and Mitigation

Wetlands

The proposed overhead configuration for the GSPL Line will allow GridAmerica to minimize impacts to wetlands as transmission line structures and conductor pulling sites can often be located outside of delineated wetland areas or sited to minimize wetland impacts. Wetlands located within the GSPL ROW may be impacted by vegetation clearing and access road construction/enhancement for access to structures or pulling sites. Upland areas that are adjacent to wetlands may also be disturbed resulting in temporary, localized impacts to surface hydrology and water quality. Impact to wetlands from disturbance of adjacent upland areas will be avoided or minimized by use of erosion and sediment control BMPs, including maintaining undisturbed vegetation buffers where possible, minimization of disturbed areas, use of swamp mats, consideration of winter construction, installation of silt fencing, and re-establishment of vegetative cover.

Hydrological impacts on wetlands could occur from changes in surface topography or compaction of the adjacent upland soils where structures are located or due to temporary work space areas. Hydrological impacts will be minimized by restoring surface topography to pre-construction grade, and by the re-establishment of vegetation cover.

Where vegetation clearing is required within wetlands to establish the necessary conductor clearance, clearing equipment will operate from swamp mats, or low-ground-pressure tracked vehicles will be utilized to minimize impacts associated with rutting and soil disturbance.

While accidental leaks and spills during construction are not anticipated, GridAmerica will develop and implement a SPCCP to minimize any potential impacts to wetlands. Construction crews will have sufficient supplies of absorbent and barrier materials on site to contain and clean up releases in the event of a spill. To reduce the likelihood of a spill entering wetlands, GridAmerica will avoid storing hazardous materials, chemicals or lubricating oils, refueling vehicles and equipment, or parking vehicles overnight within 100 feet of the edge of a wetland, unless no practicable alternatives are available.

Wetland impacts will occur where the GSPL ROW includes forested wetlands and ROW clearing will be required. Removal of trees within the ROW is required to ensure the safe and reliable operation of the transmission line. Removal of woody vegetation would not require dredging or filling, or loss of wetland acreage, but would convert the forested wetland to scrub-shrub or emergent wetland. In a landscape dominated by forested wetlands, creation or expansion of scrub-shrub and emergent wetlands that were created during construction and operation of the existing Quebec-New England HVDC line adds to the ecological diversity, and these wetlands will continue to provide valuable functions and values in the project area. More open wetlands provide habitat for certain species of turtles and amphibians, foraging habitat for flycatchers and other insectivorous birds, and different berry and seed sources compared to forested wetlands. GSPL will consult with permitting agencies to determine appropriate compensatory mitigation for impacts caused by conversion of forested wetlands to scrub-shrub or emergent wetland.

GridAmerica has commenced wetland field delineations within the proposed ROW expansion and along access roads and ancillary work sites. The field delineation will determine the limits of wetland areas and allow GridAmerica to identify opportunities to avoid or minimize wetland impacts during the placement of

structures and work areas. The estimated acreage of direct impacts on wetlands, including wetland areas requiring clearing, will be determined following completion of the detailed wetland field delineations. Final engineering design will be adjusted based on results of delineations to place locations of structures, construction work areas, and temporary access roads in such a manner as to avoid wetland crossings and impacts to the extent practicable.

Vernal Pools

Final engineering design will be adjusted to avoid impacts to vernal pools at structure and work area locations to the extent practicable. If any vernal pools are identified within the proposed ROW, or within a distance where construction activities could disrupt rare species breeding within the vernal pool, GSPL will consult with the agencies to determine necessary mitigation measures.

Floodplains

Installation of permanent structures and foundations within floodplains can reduce flood storage capacity of the floodplain. Given the small cross-sectional area and volume displacement of transmission structures, floodplain impacts are expected to be minimal. Installation of permanent structures within floodplains also introduces the risk of potential damage to the structures in the event of flooding, providing additional incentives for GridAmerica to avoid structures in floodplains to the extent practical. The proposed overhead configuration for the GSPL Line will allow GridAmerica to avoid entirely, or greatly reduce, the need for installation of structures within a floodplain, as the transmission line structures and conductor pulling sites can generally be located outside of floodplains. The layout and design of the proposed converter stations will also avoid flood hazard areas.

3.5 WILDLIFE, VEGETATION AND TERRESTRIAL HABITATS

3.5.1 Environmental Setting

3.5.1.1 Vegetation

The proposed GSPL Line traverses several vegetation community types including forested wetlands and uplands, open wetlands and uplands, and open water. The proposed Project route will cross about 52 miles of land in Vermont with approximately 49.4 miles of this crossing occurring within forested upland (See Table 3.5-1). There are generally three types of forest formations in the Project area, depending on location and elevation (See Figure 3.5-1). The Northern Hardwood Forest Formation consists of sugar maple, American beech, yellow birch and hemlock [Sorenson and Thompson 2000]. This forest type transitions to the Spruce-Fir-Northern Hardwood Forest Formation at higher elevations and further north. To the south, the transition is made to the Oak-Pine-Northern Hardwood Forest Formation. These forest formations are characterized by an abundance of the species associated with their name. Other somewhat common species scattered throughout these forests include white ash, basswood, butternut, hophornbeam and black cherry. Understory species can consist of striped maple, hobblebush, beaked hazelnut, alternate-leaved dogwood, and shadbush. The converter station located in Norton, Vermont will also be located within forested upland (See Table 3.5-2 for acreage).

Table 3.5-1: Vegetation Crossed by the GSPL Line			
Distance Crossed (Linear Miles)			
Vegetation Type	**Vermont**	**New Hampshire**	**Total**
Forest Upland	49.44	5.73	55.17
Forest Wetland	0.42	0.00	0.42
Open Upland	1.43	0.75	2.18
Open Wetland	0.37	0.00	0.37
Open Water	0.08	0.17	0.26
Source: Google Imagery			

Table 3.5-2: Vegetation on the Proposed Converter Station Sites		
Station Name	**Vegetation Type**	**Acres**
Monroe Converter Station	Forest Upland	13.6
Norton Converter Station	Forest Upland	16.4
Source: Google Imagery		

In New Hampshire, the GSPL Line will cross approximately seven miles with approximately 5.7 miles consisting of forested uplands, of the Northern Hardwood Forest Formation (See Table 3.5-1). The Monroe Converter Station will also be located within forested upland.

3.5.1.2 Conservation Lands Wildlife Species

The GSPL Line will cross publicly and privately conserved lands. These lands include federal and state protected lands intended to preserve forested and open spaces, wildlife habitat, outdoor recreational areas, and water resources (VANR 2017. NCED 2017). Figure 3.8-1 in Exhibit F shows the location of the federal and state conserved lands relative to the Project, and the areas are discussed in more detail in Section 3.8.1.

As an example of forested habitats, in 2000, 103 species of birds were recorded as breeding birds in the West Mountain Wildlife Management Area ("WMA") (Vermont Institute of Natural Science 2000). Some of the bird species in Vermont which are listed as uncommon to rare include the gray jay (*Perisoreus canadensis*), black-backed woodpecker (*Picoides arcticus*), boreal chickadee (*Poecile hudsonicus*), rusty blackbird (*Euphagus carolinus*), and the Tennessee (*Leiothlypis peregrine*), Cape May (*Setophaga tigrina*), Wilson's (*Cardellina pusilla*), and bay-breasted (*Setophaga castanea*) warblers. Additionally, the spruce grouse (*Falcipennis Canadensis*) breeds in the northern extremity of West Mountain WMA.

In Lewis and Bloomfied, Vermont the GSPL Line will cross a total of about 5 linear miles of the Conte National Fish & Wildlife Refuge ("NFWR"). Red spruce and fir communities within the Conte NFWR provide habitat to several bird species including Swainson's thrush (*Catharus ustulatus*), yellow-bellied flycatcher (*Empidonax flaviventris*), red-breasted nuthatch (*Sitta canadensis*), ruby-crowned kinglet (*Regulus calendula*), blackburnian warbler (*Setophaga fusca*), rusty blackbird, Canada warbler (*Cardellina canadensis*), blackpoll warbler (*Setophaga striata*), bay-breasted warbler, boreal chickadee, black-back woodpecker, gray jay, and spruce grouse. Within the Wildlife Refuge, Vermont Electric Transmission Company ("VETCO"), the owner and operator of the existing Quebec-New England HVDC line, is involved with the Woodcock Habitat Management Demonstration Project which aims to improve and create woodcock habitat within the refuge. The American woodcock (*Scolopax minor*) has specific habitat

requirements including forest openings, shrubby areas, and young hardwoods. Previously, this habitat was provided by abandoned farmland but due to vegetative succession and increased development woodcock preferred habitat has declined. The existing ROW currently provides cleared early successional habitat which has been treated through vegetation shredding and mowing in early spring to maintain woodcock roosting and nesting habitat. The ROW is one of few regions in the predominantly forested state of Vermont to afford such woodcock preservation and enhancement opportunity [VFWD 2017]. The Wildlife Management Institute has monitored the influence of habitat improvement on woodcocks within the refuge through the use of radio-transmitters [Wildlife Management Institute 2014].

3.5.1.3 Natural Communities in Vermont

A natural community is an assemblage of plants and animals, their physical environment, and the natural processes that affect them [VANR 2004]. The Vermont Natural Heritage Inventory ("VNHI") further defines and ranks natural community types: S1 to S5 ranging from very rare to very common. The number of occurrences a community type exhibits within the state determines the rarity of that community type. VHNI seeks to protect natural community types that are ranked S1, S2, and S3. Within Vermont, currently 80 upland and wetland natural community types are recognized. Of these communities, five are crossed by the proposed GSPL Line. The primary community crossed is the Northern Hardwood Forest, identified as very common by VHNI. Table 3.5-3 lists the natural communities that are crossed by the proposed GSPL Line, the approximate acres of each community that is crossed, and the State rank of each community.

Table 3.5-3: State Ranked Natural Communities Crossed by the GSPL Line in Vermont

Natural Community	Linear Miles	VT State Rank[1]
Dry Red Oak-White Pine Forest	0.1	S3
Lowland Spruce-Fir Forest	1.1	S3
Northern Hardwood Forest	9.6	S5
Northern White Cedar Swamp	0.1	S3
Red Spruce-Northern Hardwood Forest	2.9	S5

[1] Value that best characterizes the relative rarity (abundance) or endangerment of a native taxon throughout its range in Vermont: S3 = uncommon; S5 = very common
Source: VFWD, email with GIS data files from E. Marshall, VFWD to R. Delahunty, Tetra Tech, May 27, 2017.

3.5.1.4 New Hampshire Exemplary Communities

In New Hampshire, there are two NH designated exemplary communities: Calcareous riverside seep, and Calcareous sloping fen system, both of which are located along the Connecticut River in Monroe [NH Natural Heritage 2017]. Seep communities are sensitive to physical disturbance of their moist soils, to changes in local hydrology, and to increased inputs of sediments, pollutants, or nutrients. GridAmerica will review and confirm locations of these seep communities, and ensure that structures are not placed in these important areas.

3.5.1.5 Important Bird Areas

BirdLife International and the National Audubon Society have implemented a program to identify Important Bird Areas ("IBAs") that provide essential habitat for one or more species of bird. IBAs are used to implement large-scale conservation efforts with the goal of protecting all bird species within identified habitats.

Of Vermont's 17 IBAs, two occur along the proposed route: the Nulhegan Basin IBA which is crossed by the proposed route in the towns of Lewis and Bloomfield, and the Victory Bog Basin IBA which is crossed by the proposed route in the town of Victory [Audubon Vermont 2017].

The Victory Bog Basin consists of a large low relief basin providing 1,500 acres of boreal habitat with forests and wetlands. The basin supports a mix of habitat types including large tracts of spruce-fir and northern hardwood forest, alder swamp, sedge meadow, and tamarack bog. These habitats support a number of representative boreal and wetland bird species including the American bittern (*Botaurus lentiginosus*), Bay-breasted warbler, black-backed woodpecker, Cape May warbler, gray jay, Lincoln's sparrow (*Melospiza lincolnii*), Northern harrier (*Circus cyaneus*), rusty blackbird, Virginia rail (*Rallus limicola*), Wilson's warbler, and yellow-rumped warbler (*Setophaga coronate*). The state endangered Spruce Grouse habitat is also found within the Victory Bog Basin which could serve as potential site for reintroduction of this species [Audubon 2017a].

The Nulhegan Basin is the largest IBA in Vermont, providing 2,600 acres of boreal habitat with forests and wetlands. This IBA is home to several Vermont state-classified rare and endangered species including the bay-breasted warbler, black-backed woodpecker, boreal chickadee, Cape May warbler, gray jay, palm warbler (*Setophaga palmarum*), Tennessee warbler, and Wilson's warbler. The largest population of the Spruce Grouse can be found within this IBA. In addition to the Spruce Grouse, other state-classified endangered species include the common loon which nests along several ponds within the basin [Audubon 2017b].

There are four IBA complexes, areas which focus on individual species at multiple sites, within Vermont including the Peregrine Falcon Eyrie IBA Complex, Common Loon Lakes IBA Complex, and Bicknell's Thrush IBA Complex. These complexes protect potential breeding sites along cliffs, lakes, high elevation respectively within Vermont. The GSPL Line crosses the Common Loons Lake Complex in Concord and Waterford, Vermont [Audubon Vermont 2017].

New Hampshire also has 17 identified IBAs; however, these will not be crossed by the proposed GSPL Line. [Audubon 2017c].

3.5.1.6 Migratory Birds

Migratory birds and eagle species are documented to occur along the GSPL Line. These birds are protected by the Migratory Bird Treaty Act ("MBTA") and the Bald and Golden Eagle Protection Act ("BGEPA"). Taking of migratory birds or eagles is prohibited, unless otherwise authorized by the FWS. Bird species of particular conservation concern that may be potentially affected by the Project include the bald eagle (*Haliaeetus leucocephalus*), Bicknell's thrush (*Catharus bicknelli*), black-billed cuckoo (*Coccyzus erythropthalmus*), Canada warbler, Cape May warbler, evening grosbeak (*Coccothraustes vespertinus*), lesser yellowlegs (*Tringa flavipes*), *olive*-sided flycatcher (*Contopus cooperi*), prairie warbler (*Dendroica discolor*), red-throated loon (*Gavia stellate*), rusty blackbird, semipalmated sandpiper (*Calidris pusilla*), whimbrel (*Numenius phaeopus*), and wood thrush (*Hylocichla mustelina*) (IPAC, Vermont Center For Ecostudies). All of these migratory birds occur along the proposed route for breeding and foraging, except the bald eagle, which is present year-round.

3.5.1.7 Mammals

Characteristic mammals of Vermont and New Hampshire's northern hardwood forests include small woodland species such as the masked shrew (*Sorex cinereus*), eastern cottontail (*Sylvilagus floridanus*), red squirrel (*Sciurus vulgaris*), northern flying squirrel (*Glaucomys sabrinus*), white-footed mouse

(*Peromyscus leucopus*), woodland jumping mouse (*Napaeozapus insignis*), deer mouse (*Peromyscus maniculatus)*, chipmunk (*Tamias striatus*) and several bat species, but also include larger species such as the white-tailed deer (*Odocoileus virginianus*), porcupine (*Erethizon dorsatum*), black bear (*Ursus americanus*), and American marten (*Martes americana*). As elevation and temperature increase to north common species such as red-backed voles (*Myodes gapperi*), red fox (*vulpes vulpes*), fisher (*martes pennanti*), and moose (*Alces alces*) have adapted to colder temperatures and decreased food availability.

3.5.1.8 Herpetofauna

Forested wetland and waterbodies present in Vermont and New Hampshire provide suitable breeding habitat for a variety of amphibians and reptiles. This includes a number of salamander species including the eastern redback salamander (*Plethodon cinereus*), spotted salamander (*Ambystoma maculatum*), northern dusky salamander (*Desmognathus fuscus*), spring salamander (*Gyrinophilus porphyriticus*), and northern two lined salamander (*Euycea bislineata*), which can be found in the saturated soils or leaf litter and woody debris near streams, seeps or vernal pools or within well-oxygenated, cold clear streams in mixed hardwood forested areas. Wood frogs (*Lithobates sylvaticus*), northern red belly snakes (*Storeria occipitomaculata occipitomaculata*), eastern newts (*Notophthalmus viridescens*), and wood turtle (*Clemmys insculpta*) can also be found in forested woodland areas.

3.5.2 Impacts and Mitigation

Anticipated temporary construction activities include construction and vehicle traffic, traffic diversion, clearing of all incompatible woody vegetation, grading of lay down areas for equipment, excavation, temporary matted wetland and stream crossings, and other associated construction activities. However, expansion of a previously developed corridor minimizes impacts to existing land uses as well as the environment, and is a sound land use and environmental siting principle as opposed to the development of an entirely new ROW. The co-location of the Project with the existing Quebec-New England HVDC line ROW will minimize adverse habitat impacts associated with ROW clearing. Habitat conversion from forested to shrub and open land will occur. Existing, open shrub/herbaceous land cover will remain intact following construction except at the new structure locations. Transmission line ROW will be allowed to revegetate to early successional habitat and will be maintained as early successional habitat under the vegetation management program to be implemented during Project operation.

Conversion of areas along the GSPL Line from forest to scrub/shrub and open land may result in habitat loss, species disturbance, and loss of slow moving individual animals such as turtles, mice, salamanders, etc. due to equipment movement/travel, particularly during clearing activities. Time of year restrictions on tree clearing will help to minimize impacts to nesting birds, deer wintering areas, and roosting habitat for bats. The cumulative effect of overlapping restriction periods on the overall construction schedule and duration will also be evaluated.

The proposed GSPL route crosses a variety of vegetative communities with approximately 14 linear miles of the proposed GSPL Line crossing through Vermont state ranked natural communities. Of these areas, approximately 1.36 linear miles crossed are considered uncommon natural community types and approximately 12.5 linear miles are considered very common. GridAmerica will work with the VANR and Vermont Fish and Wildlife Department ("VFWD") during Project permitting to identify measures to avoid, minimize, or mitigate impacts to these state ranked natural communities. In New Hampshire, there are two NH designated exemplary communities: Calcareous riverside seep, and Calcareous sloping fen system, both of which are located along the Connecticut River in Monroe GridAmerica will review and confirm locations of these seep communities, and take measures to avoid placement of structures in these important areas.

Impacts to migratory birds may result from the clearing of potential nesting and foraging habitat while construction noise may cause migratory birds and other animals to be temporarily displaced to adjacent areas. Eagle nest surveys may be required, particularly in the area of the Connecticut River crossing and along the shoreline of Comerford Reservoir, to document potential breeding activity in order to minimize disruption by ROW clearing and other construction activities.

Noise will occur due to associated construction activities such as tree and site clearing, excavation, installation of structures, and other typical installation activities which will occur for various durations at any one location along the GSPL Line. Disturbed wildlife will avoid active construction areas and temporarily inhabit and use the abundant nearby available habitat. Best management practices and specific construction methods will be implemented, where appropriate, as discussed in Section 3.12.

The long-term operation of the GSPL Line will not significantly impact any significant wildlife habitat, freshwater wetland plant habitat, aquatic habitat, or wildlife travel corridors. GridAmerica will work with federal and state regulatory agencies as well as other stakeholders to identify measures to avoid and minimize these impacts, and, where avoidance and minimization is not practicable, to mitigate the impacts.

Additionally, the purpose of the GSPL Project is to bring clean, renewable power to the regional power system, which will reduce the greenhouse gases that contribute to climate change. The Northeast region is highly vulnerable to projected changes in temperature and precipitation associated with rising climates, specifically natural communities such as Spruce-Fir Forest and Northern hardwood Forest. Projections indicate a rise in average annual temperatures by approximately "3 to 5ºC" and a "10 to 20 percent" increase in winter precipitation by the end of the century [Grund and Walberg 2013]. Observable changes in forest growth rates and wildlife distribution have been documented by the U.S. Department of Agriculture ("USDA"). Over the past 100 years, a decline in the productivity and spread of northern hardwoods within the Northeast has been attributed by several studies to increases in annual average climate and shorter winters [USDA 2014]. Wildlife surveys have shown a correlation between rising temperatures and changes in timings of migration and mating, and shifts in range and diet which have been associated with a rise in parasites, disease and even mortality in several species [USDA 2014].

3.6 FISHERIES AND AQUATIC HABITATS

3.6.1 Environmental Setting

Streams and rivers in Vermont and New Hampshire provide a diversity of habitats that range from low gradient warmwater reaches to higher elevation, steep gradient coldwater reaches. This diversity of habitat results in a variety of aquatic species, including macroinvertebrates, mussels, herpetofauna and fish.

In Vermont, the proposed GSPL Line crosses through the Passumpsic and Upper Connecticut River Basins. Due to the occurrence of colder and high elevations streams, the Passumpsic and Upper Connecticut River Basins support naturally reproducing populations of salmonids, such as rainbow trout (*Oncorhynchus mykiss*), brown trout (*Salmo trutta*), and native brook trout (*Salvelinus fontinalis*). For these species, both basins' smaller tributaries serve as important spawning and juvenile rearing habitat. While naturally occurring populations of rainbow and brown trout exist within these basins, these species were originally introduced to Vermont from Europe. The Passumpsic River is stocked with these species annually in the spring by the VFWD [VDEC 2014].

In addition to the coldwater habitat, the Passumpsic and Upper Connecticut River Basins also provide warm water habitat for a variety of fish species. Often these habitats occur at lower elevations, in areas with lower gradient, and in some instance, reflect man-made impoundments within the waterways. In addition to the

channels themselves, flooded wetlands within the basin attached to the waterways are important habitat components, for at least one or more lifestage of many of these warmwater fish species. Commonly occurring species including yellow perch (*Perca flavescens*), northern pike (*Esox lucius*), chain pickerel (*Esox Niger*), largemouth bass (*Micropterus salmoides*), smallmouth bass (*Micropterus dolomieui*), walleye (*Stizostedion vitreum*) bullhead (*Ameirus nebulosus*), pumpkinseed (*Lepomis gibbosus*), and burbot (*Lota lota*) [VDEC 2014, VDEC 2011].

The Vermont Stream Crossing guidelines identify the primary periods of concern in Vermont for fish spawning and movement to occur, as between April and November (dependent on species). Additionally, many species such as the brook and rainbow trout move within the basin from April through December for general foraging and refugia. Successful and timely passage of fish during periods of prolonged high flow is critical for successful spawning and to decrease vulnerability to predation and disease [VFWD 2016].

In New Hampshire the proposed GSPL Line crosses over brooks and streams that are hydrologically connected to Scarritt Brook and the Comerford Station Dam on the Connecticut River and McIndoe Falls. Typical anadromous fish species include rainbow trout, brown trout and the native brook trout and warm water species such as walleye and northern pike. The New Hampshire of Fish and Game Department ("NHFG") stocks these waters with these trout species annually in May; however, due to accumulated mercury in these fish populations, the state of New Hampshire considers the entire river system to be contaminated. The New Hampshire Stream Crossing guidelines outline that the most favorable time for construction in streams should be during periods of low-flow from July 1 to October 1 in order to minimize potential impacts to fisheries from disturbance [NHFGD 2009].

3.6.2 Impacts and Mitigation

Because the proposed GSPL Line is an overhead configuration, it is typically possible to avoid placement of facility components directly within fishery habitats. By avoiding construction within waterways and by implementing BMPs for vegetation clearing, stormwater management, and storage of and use of fuels, lubricants, oils and other potential contaminants, impacts to surface waters and fisheries can be minimized. To the extent that safety and design requirements allow it, a vegetative buffer along stream banks will be maintained.

Impacts to aquatic communities from construction and operation of the Project will depend upon the physical characteristics of the streams (e.g. flow, bottom substrate, channel configuration, and gradient), the construction technique utilized, time of year of the crossing, and presence of specific aquatic species (in particular coldwater fisheries). GridAmerica will coordinate with applicable regulatory agencies regarding crossing methods and fishery restrictions, in particular relative to the need for new or improved access that will involve the need to get vehicles, equipment and supplies moved along the ROW. Given the extent and quality of existing access roads associated with the adjacent VELCO transmission ROW in Vermont and NEP ROW in New Hampshire, it is anticipated that the potential for access impacts can be minimized where not entirely avoided.

Construction of the GSPL Line may include temporary impacts on waterbodies and fisheries crossed by access road segments or located within associated workspace which may temporarily restrict fish passage during construction. However, in order to minimize impacts to local fish migrations, GridAmerica will adhere, to the extent practicable, to the state stream crossing guidance and recommended time-of-year restrictions. Applicable stream crossing permits will be obtained. Should compliance with timing restrictions not be practicable, GridAmerica will evaluate alternative construction techniques that may be employed to avoid direct alteration of the waterbodies. Other temporary impacts from access road crossings could include disruption to food resources, increased sedimentation, and water turbidity downstream from

the construction workspace which will be minimized by design of appropriate crossing techniques (e.g. culverts, bridges, or drive arounds) and through the use of sediment and erosion control BMPs during construction.

Removal of streamside trees and vegetation at access road crossings also presents the potential for temporary impacts from the reduction of shading to a stream and the elimination of escape cover, and may potentially result in a locally elevated water temperature near and downstream of the road crossing. Elevated water temperature can lead to a reduction in levels of dissolved oxygen ("DO") and influence fish survival and fitness. Although these impacts are local to the stream crossing (typically less than 20 feet of stream bank is cleared), and highly variable given the surrounding landscape, GridAmerica will maximize the use of existing access roads, will maintain herbaceous vegetation cover to the extent practicable and will not remove stumps of cleared trees and shrubs in order to encourage re-establishment of woody shrubs and herbaceous species along the stream banks.

Post-construction and operational impacts to fisheries will be minimal with the restoration of vegetation within the ROW minimizing erosion potential relative to streams. The approved vegetation management plan will specify means and methods that are designed to avoid and minimize operational impacts to surface waters and aquatic habitats, associated with vegetation management of the transmission line.

3.7 THREATENED OR ENDANGERED SPECIES

3.7.1 Environmental Setting

Federally-Listed Species

Section 7(a) of the Endangered Species Act ("ESA"; Public Law 93-205, as amended) establishes a national program administered by the USFWS for the conservation of threatened and endangered species of fish and wildlife and for terrestrial species and the ecosystems on which they depend.

The USFWS identifies known listed species occurrence in Vermont and New Hampshire by county and town. Three federally-listed species are identified within Essex and Caledonia Counties, Vermont - the Canada lynx (*Lynx canadensis*), dwarf wedgemussel (*Alasmidonta heterodon*), and northern long-eared bat (*Myotis septentrionalis*) [FWS 2016a]. Three federally-listed species are identified within Grafton County, New Hampshire – dwarf wedgemussel, northern long-eared bat, and small whorled begonia [FWS 2016b].

The VFWD, Wildlife Diversity Program, Natural Heritage Inventory ("NHI"), documents the presence of rare, threatened and endangered ("RTE") species, uncommon species, and natural communities in Vermont, including federally-listed species [VFWD 2015]. On May 24, 2017, an information request was submitted to VFWD regarding the potential presence of RTE species along the Project route. On May 27, 2017, the VFWD responded, and indicated that two federally-listed species have been documented within 1 mile of the existing Quebec-New England HVDC centerline and could potentially occur within the Project area (Table 3.7-1). No federally-listed plant species are documented within 1 mile of the existing Quebec-New England HVDC centerline in Vermont based on VFWD data. Based on available data in New Hampshire, there is the potential for the presence of small whorled pogonia near the Project site.

Table 3.7-1: Federally-Listed Threatened or Endangered Species with the Potential to Occur in the Project Area			
Common Name	**Scientific Name**	**Federal Status[1]**	**State Occurrence**
Mammals			
Canada Lynx	*Lynx Canadensis*	Threatened	VT
Northern Long Eared Bat	*Myotis septentrionalis*	Threatened	VT and NH
Mussels			
Dwarf Wedgemussel	*Alasmidonta heterodon*	Endangered	NH
Plants			
Small Whorled Pogonia	*Isotria medeoloides*	Threatened	NH

[1] Legal protection under the federal Endangered Species Act, U.S. Fish and Wildlife Service ("USFWS")
Source: VFWD, May 27, 2017

State-Listed Species

Based on the same consultations described above for federally-listed species, 15 state-listed or uncommon wildlife species have been documented within 1 mile of the Quebec-New England HVDC line in Vermont and could potentially occur within the Project area (Table 3.7-2). The response from the VFWD also indicated that there are 30 RTE plant species that have been documented within 1 mile of the existing Quebec-New England HVDC centerline in Vermont and could potentially occur within the Project area (Table 3.7-3).

Table 3.7-2: State-Listed Rare, Threatened, or Endangered Wildlife Documented within 1 Mile of the Existing Quebec-New England HVDC Line in Vermont			
Common Name	**Scientific Name**	**VT State Status[1]**	**VT State Rank[2]**
Birds			
Great Blue Heron	*Ardea Herodias*	Rare	S3S4B
Rusty Blackbird	*Euphagus carolinus*	Endangered	S3B
Spruce Grouse	*Falcipennis canadensis*	Endangered	S1
Bald Eagle	*Haliaeetus leucocephalus*	Endangered	S1B,S4N
Gray Jay	*Perisoreus canadensis*	Rare	S2
Black-backed Woodpecker	*Picoides arcticus*	Rare	S2
Palm Warbler	*Setophaga palmarum*	Rare	S1B
Insects			
Boreal Long-lipped Tiger Beetle	*Cicindela longilabris*	Rare	S2
Harlequin Darner	*Gomphaeschna furcillata*	Rare	S2S3
Lake Emerald	*Somatochlora cingulata*	Rare	S1S2
Forcipate Emerald	*Somatochlora forcipata*	Rare	S2S3
Delicate Emerald	*Somatochlora franklini*	Rare	S1S2
Kennedy's Emerald	*Somatochlora kennedyi*	Rare	S1S2
Ocellated Emerald	*Somatochlora minor*	Rare	S2

Table 3.7-2: State-Listed Rare, Threatened, or Endangered Wildlife Documented within 1 Mile of the Existing Quebec-New England HVDC Line in Vermont

Common Name	Scientific Name	VT State Status[1]	VT State Rank[2]
Mussels			
Eastern Pearlshell	*Margaritifera*	Threatened	S2

[1] Legal protection under the Vermont Endangered Species Law (10 V.S.A. Chap. 123)
[2] Value that best characterizes the relative rarity (abundance) or endangerment of a native taxon throughout its range in Vermont: S3S4B = uncommon to common breeder; S3B = uncommon breeder; S1 = very rare; S1B,S4N = very rare breeder, common in winter; S2 = rare; S1B = very rare breeder; S2S3 = rare to uncommon; S1S2 = very rare to rare
Source: VFWD, May 27, 2017

Table 3.7-3: State-Listed Rare, Threatened, or Endangered Plants Documented within 1 Mile of the Existing Quebec-New England HVDC Line in Vermont

Common Name	Scientific Name	VT State Status[1]	VT State Rank[2]
Large Water-starwort	*Callitriche heterophylla*	Rare	S2
Emmon's Sedge	*Carex albicans var. emmonsii*	Rare	S1
Northeastern Sedge	*Carex cryptolepis*	Rare	S2S3
Shore Sedge	*Carex lenticularis*	Rare	S2S3
Muehlenberg's Sedge	*Carex muehlenbergii var. muehlenbergii*	Threatened	S2
Few-flowered Panic-grass	*Dichanthelium oligosanthes ssp. scribnerianum*	Rare	S2
Ground-fir	*Diphasiastrum sabinifolium*	Rare	S2
Wright's Spikerush	*Eleocharis diandra*	Rare	S2
Marsh Horsetail	*Equisetum palustre*	Threatened	S2
Fir Clubmoss	*Huperzia selago*	Rare	S1
River-bank Quillwort	*Isoetes riparia*	Rare	S2
Tuckerman's Quillwort	*Isoetes tuckermanii*	Rare	S1
Greene's Rush	*Juncus greenei*	Endangered	S2
American Shore-grass	*Littorella americana*	Rare	S2
Small-flowered Rush	*Luzula parviflora*	Rare	S2S3
Green Adder's-mouth	*Malaxis unifolia*	Rare	S2
Farwell's Water-milfoil	*Myriophyllum farwellii*	Rare	S2S3
Auricled Twayblade	*Neottia auriculata*	Endangered	S1
Bog Aster	*Oclemena nemoralis*	Rare	S2
Woodland Cudweed	*Omalotheca sylvatica*	Endangered	S1
Sweet Coltsfoot	*Petasites frigidus var. palmatus*	Threatened	S2
White-fringed Orchid	*Platanthera blephariglottis var. blephariglottis*	Rare	S2
Vasey's Pondweed	*Potamogeton vaseyi*	Rare	S2
Shining Rose	*Rosa nitida*	Rare	S2

Table 3.7-3: State-Listed Rare, Threatened, or Endangered Plants Documented within 1 Mile of the Existing Quebec-New England HVDC Line in Vermont			
Common Name	**Scientific Name**	**VT State Status[1]**	**VT State Rank[2]**
Pod-grass	*Scheuchzeria palustris*	Threatened	S2
Trailing Stitchwort	*Stellaria alsine*	Rare	S2
Sticky False-asphodel	*Triantha glutinosa*	Threatened	S1
Northeastern Bladderwort	*Utricularia resupinata*	Threatened	S1
Mountain Cranberry	*Vaccinium vitis-idaea*	Rare	S2
Lance-leaved Violet	*Viola lanceolata ssp. lanceolata*	Threatened	S1
[1] Legal protection under the Vermont Endangered Species Law (10 V.S.A. Chap. 123) [2] Value that best characterizes the relative rarity (abundance) or endangerment of a native taxon throughout its range in Vermont: S2 = rare; S1 = very rare; S2S3 = rare to uncommon Source: VFWD, May 27, 2017			

The NHFG, Nongame and Endangered Wildlife Program maintains a list of RTE species in New Hampshire, including federally-listed species. GSPL initiated consultation with the NHFG in November 2017 to determine if the portion of the proposed GSPL Line that is located within New Hampshire would impact any federal- or state-listed species. Upon review of their database against the location of the proposed GSPL Line, the New Hampshire Natural Heritage Bureau ("NH NHB") identified 16 state-threatened and endangered species which may be potentially impacted by activities within the Project area.

Table 3.7-4: State-Listed Rare, Threatened, or Endangered Animals documented by the NH NHB in New Hampshire		
Common Name	**Scientific Name**	**NH State Status[1]**
Mussels		
Dwarf Wedge Mussel	*Alasmidonta heterodon*	Endangered
[1] Legal Protection Under the NH Endangered Species Conservation Act of 1979 (NH RSA 212-A) and the federal Endangered Species Act of 1973 (42 USCA §§ 4321-4370c)		

Table 3.7-5: State-Listed Rare, Threatened, or Endangered Plants documented by the NH NHB in New Hampshire		
Common Name	**Scientific Name**	**NH State Status[1]**
Golden-fruited Sedge	*Carex aurea*	Threatened
Bailey's Sedge	*Carex baileyi*	Threatened
Chestnut Sedge	*Carex castanea*	Endangered
Crested Sedge	*Carex cristatella*	Endangered
Elk Sedge	*Carex garberi*	Threatened
Marsh horsetail	*Equisetum palustre*	Endangered
American Spurred-gentian	*Halenia deflexa ssp.*	Threatened
Northern Green Rush	*Juncus alpinoarticulatus ssp.*	Endangered
Loesel's Wide-lipped Orchid	*Liparis loeselii*	Threatened

Table 3.7-5: State-Listed Rare, Threatened, or Endangered Plants documented by the NH NHB in New Hampshire		
Common Name	**Scientific Name**	**NH State Status[1]**
Brook Lobelia	*Lobelia kalmii*	Threatened
Balsam Grounsel	*Packera paupercula*	Threatened
Fen Grass-of-Parnassus	*Parnassisia glauca*	Threatened
Shining ladies'-tresses	*Spiranthes lucida*	Endangered
Small Dropseed	*Sporobolus neglectus*	Endangered
Sticky Flase Asphodel	*Triantha glutinosa*	Endangered
[1] Legal Protection Under the NH Native Plant Protection Act (RSA 217-A)		

3.7.2 Impacts and Mitigation

Depending on the species, construction activities that have the potential to impact individuals or habitat of listed species include clearing and vegetation removal, disturbance and noise associated with equipment operation, and potential sedimentation in waterbodies and wetlands. Potential impacts from operation of the facilities could include periodic disturbance during vegetation management activities, long term habitat alteration, noise around converter station sites, and the permanent loss of a small amount of habitat at the converter station sites. Forest clearing for ROW expansion could impact protected avian species by altering potential breeding and nesting habitat. Given the extensive amount of forest in the Project area, however, avian species are anticipated to move to other breeding and nesting habitat nearby. Although the proposed GSPL Line will increase the width of the cleared ROW, the edge habitat is already established by the existing line.

Based on the results from the VFWD consultations, rare plant surveys were commenced in the fall of 2017 to identify if RTE plant species occur within the construction work space. Results of surveys are being compiled, which will aid in determining the appropriate mitigation. Additionally, the NH NHB identified 15 state-listed threatened and endangered plant species which may be potentially impacted by project activities. When feasible, structure locations can be adjusted slightly to avoid impacting RTE plant populations. In addition, clearing, construction access, workspace layout and future vegetation management will take into consideration, locations of listed plant species, and special measures will be taken to avoid or minimize impacts. Should RTE plants be identified within potential impact areas where avoidance is problematic, GridAmerica, together with the lead federal agency, will consult to determine next steps to mitigate impacts to identified species.

In addition to identified plant species, the NH NHB indicated that the site of GSPL Line crossing of the Connecticut River is an area flagged for possible impacts to the dwarf wedgemussel. No construction activities are proposed within the Connecticut River as the GSPL Line will span the river overhead; however, GridAmerica will coordinate with NH NHB and the NHFG to determine scope of surveys necessary for proposed construction activities in the vicinity of the Connecticut River.

For listed animal species that have the potential to occur within the Project footprint, habitat surveys are being undertaken, and if suitable habitat is identified, GridAmerica will consult with the USFWS and state resource management agencies to determine the need for presence/absence surveys. Should the results of presence/absence surveys identify the occurrence of federal- or state-listed species, GridAmerica will work with the agencies to develop appropriate construction means and methods to avoid, minimize and mitigate

impacts. Similarly, GridAmerica will develop plans in consultation with the agencies to address the future operation and maintenance of the facilities, as required to address listed species concerns.

3.8 LAND USE AND TRANSPORTATION

3.8.1 Environmental Setting

In Vermont, the GSPL Line is in an area known as the Northeast Kingdom, which is remote and generally undeveloped. Three counties – Caledonia, Essex and Orleans – comprise the Northeast Kingdom and the proposed GSPL Line traverses Essex and Caledonia counties with the majority of the line located in Essex County. According to the Northeast Kingdom Regional Plan 2015, approximately 95 percent of Essex County and 83 percent of Caledonia County is forested, most of which is private timberland. Cropland and pasture represent only 2 percent and 7 percent of the land area in Essex and Caledonia counties, respectively.

In New Hampshire south of the Connecticut River, the GSPL Line ROW crosses a mixture of forest land, conservation lands and some agricultural land. Land use characterization along the ROW is provided in Table 3.8-1.

Table 3.8-1: Land Uses on the GSPL Line ROW

Land use	Length Crossed (Miles)		
	Vermont	New Hampshire	Total
Agriculture	0.1	0.4	0.5
Developed Land	0.4	0.1	0.4
Forest	50.0	5.7	55.7
Open Land	1.8	0.3	2.1
Residential	0	0.1	0.1
Open water	0.1	0.2	0.3
TOTAL	52.3	6.7	59.0

Source: Data from Google Imagery at a scale of 1:1,500

Converter Stations

The proposed Norton Converter Station will be located on about 6.8 acres of private land north of State Route 114 in the town of Norton, Vermont and adjacent to the existing Quebec-New England HVDC ROW. The site is on the east side of the GSPL Line, forested, and approximately 1/3 mile away from area roads and residences.

The proposed site for the Monroe Converter Station and substation is approximately 13.6 acres of forested land owned by NEP between State Route 135 (Littleton Road) to the south and the impounded Connecticut River to the north, in the town of Monroe, New Hampshire. The Comerford Station (the former Quebec-New England HVDC converter station) is located to the southwest across Dam Road from the proposed converter station and substation site.

Federal and State-Owned Lands and Other Conservation Lands

The proposed GSPL Line will cross federal and state-owned lands in northeast Vermont and in New Hampshire, including the Silvio O. Conte NFWR – Nulhegan Basin Unit, the West Mountain WMA owned

by the state of Vermont, and the Victory State Forest. Federal and State lands that are crossed by the Project or adjacent to the GSPL Line are listed in Table 3.8-2 and shown in Figure 3.8-1.

Table 3.8-2: Federal and State-Owned Lands

State	Name	Federal or State-Owned	Towns Crossed
VT	Conte National Fish & Wildlife Refuge ("NFWR")	NFWR (Federally Owned)	Lewis, Bloomfield
VT	West Mountain Wildlife Management Area	Wildlife Management Area, Vermont Fish and Wildlife Service (State Owned)	Brunswick, Ferdinand, Granby
VT	National Forest Land	Federally Owned	Granby
VT	Victory State Forest	State Forest, Vermont Department of Parks and Recreation (State Owned)	Victory, Granby, Lunenburg
NH	Un-named	State of New Hampshire (un-designated land)	Littleton

Source: Vermont Data: Vermont Open Geodata Portal (VANR), Vt Protected Lands Data Base
New Hampshire Data: National Conservation Easement Database

The following provides a description of the designated federal and state lands crossed by the GSPL Line:

Silvio O. Conte NFWR: The Silvio O. Conte NFWR was established to protect and enhance the abundance and diversity of native plant, fish and wildlife species in the Connecticut River watershed. Portions of the refuge are located in Vermont, New Hampshire, Massachusetts, and Connecticut. The GSPL Line traverses the Nulhegan Basin Unit in Vermont, which is located in the most remote part of Vermont in the towns of Brunswick, Ferdinand, Bloomfield, and Lewis. The division headquarters and visitor contact station for this unit is located in Brunswick (about 10 miles east of Island Pond). The refuge lands consist of more than 26,600 acres of conifer and deciduous forest interspersed with forested wetlands, peatlands and shrub swamps, and contain three of the four tributaries of the Nulhegan River. These lands are nested within a working forest landscape exceeding 150,000 acres. Located just a few miles south of the Canadian border, the basin's vegetation most closely resembles that of the northern Appalachian Mountains, interspersed with elements of the boreal forest to the north. This division is known for abundant songbirds, particularly boreal species and warblers, and has been designated an important bird area by the National Audubon Society. It is open to the public for hunting, fishing, wildlife observation and photography, environmental education, and interpretation. Visitor opportunities include formal trails, access to remote areas off trails, and more than forty miles of gravel roads including groomed trails for snow mobiles in the winter [USFWS 2017].

West Mountain Wildlife Management Area: West Mountain Wildlife Management Area (WMA) is a 22,971acre parcel of land owned by the State of Vermont and managed by the Vermont Fish & Wildlife Department. Located in the towns of Maidstone, Ferdinand and Brunswick, the WMA ranges north from Maidstone Lake to Route 105, and east from South America Pond to the Connecticut River. The park was formed in 1999 when the land was purchased from Champion International as part of a large scale land conservation partnership of state, federal and private organizations.

Access to the WMA is available along miles of dirt roads. Main entry points are South America Pond Road off Route 105, and Maidstone Lake and Paul Stream Roads off Route 102. Elevations on the WMA range from 2,733 feet on West Mountain to 1,100 feet along the lower stretches of Paul Stream. The terrain varies from high-elevation spruce-fir to lowland bogs. The Vermont Fish & Wildlife Department has identified

14 species of plants listed as rare or endangered and eight sites of ecological significance on the WMA. The property encompasses nine major ponds, over 75 miles of streams, and many diverse wetland complexes. [VTFPR 2017, VTFWS 2017].

National Forest Land: The GSPL Line passes through an area of National Forest Land in the southeast corner of Granby, Vermont. On April 20, 1993, the area became a unit of the Green Mountain National Forest through the Forestry Legacy Program. This National Forest Land is administered by the Green Mountain and Finger Lakes National Forest Service Office in Rutland, Vermont and the Vermont Department of Forests, Parks and Recreation works to ensure the provisions of the conservation easement on the land are being carried out. The National Forest land includes the area around Cow Mountain Pond, a native trout pond and associated 1,660 acres forested lands with hiking and snowmobile trails [USDA Forest Service 1993).

Victory State Forest: Victory State Forest consists of approximately 15,000 acres of forest land in the towns of Victory, Granby, and Lunenberg surrounding the Victory WMA. Much of Victory State Forest was acquired from lumber or paper companies and has a long history of management for timber products. Remnants of sawmills still remain within the forest. The forest is managed mainly for timber and wildlife habitat. Victory State Forest is open to dispersed recreation such as hunting, trapping, wildlife viewing, snowmobiling, hiking, snowshoeing, and horseback riding. Portions of the forest are open for primitive camping. Vermont Association of Snowmobiler trails run through the property and the Vermont Horse Council assists in the management of a multi-use trail open to horseback riding. Gravel roads within the forest are open for horseback riding as well as biking. Elevations at the State Forest range from elevation 2,949 feet in the north end of the forest at Umpire Mountain to elevation 1,400 feet on the Bog Pond Trail in the south end of the forest [Vermont ANR 2017].

Un-named State-Owned Land with No Use Designation: The GSPL Line travels through an un-named area of state-owned land in Littleton, New Hampshire. The area is vacant, forested and does not have a conservation or other land use designation.

Transportation

The GSPL Line will cross one interstate highway (Route 93 in Littleton, New Hampshire), two railroads, and many smaller state, county and local roads (See Figure 3.8-2).

3.8.2 Impacts and Mitigation

To minimize land use impacts, GridAmerica has sited the GSPL Line adjacent to the Quebec-New England HVDC line ROW. As such, the GSPL Line ROW will be consistent with the existing utility corridor land use that exists along the route. Like the existing ROW, the GSPL ROW will be cleared, and maintained for the operation of the proposed transmission system and the structures will be approximately the same height. To minimize impacts GridAmerica will use the extensive access road system already in place along the Quebec-New England HVDC line and use existing roadway system and access roads that provide offsite access on to the Quebec-New England HVDC line ROW.

Approximately 94 percent of the area adjacent to the existing Quebec-New England HVDC ROW is forested and a significant portion of these lands include state and federal lands as well as privately owned lands with conservation easements. The principal use of these areas is for recreation including hiking, fishing, hunting and other outdoor activities. As the GSPL Line is adjacent to the Quebec-New England HVDC ROW it avoids forest segmentation as compared to a new ROW location and it will only affect a

narrow band of forest along the ROW. Thus, the vast forest areas beyond the Project will not be affected and the work is not expected to impact the use and enjoyment by the public of the areas.

The GSPL Line avoids town centers thereby minimizing impacts on people living in the area (only 0.1 miles of the 59 mile-long GSPL Line is within a residential land use area). With respect to farmland, the Project has been sited largely away from agricultural areas and once constructed, will not affect the limited agricultural land uses adjacent to the ROW.

With respect to the converter stations, their development will result in additional clearing of forest land and a conversion to industrial/utility use. The Norton Converter station in Vermont is situated in a remote location where few people will see or encounter the facility and it is consistent with the nearby land use of the existing Quebec-New England HVDC line. The Monroe Converter Station and substation in Monroe, New Hampshire is on a large parcel of property near other similar land uses (e.g. the existing Quebec-New England HVDC line, the existing Comerford Station (e.g. the former Quebec-New England HVDC converter station) and the Comerford hydro-electric facility. The Monroe Converter Station will be consistent with these land uses.

Consultation with Land Management Agencies and Easement Holders

GridAmerica is actively discussing the Project with the applicable land management agencies and easement holders to develop a comprehensive approach to mitigating impacts on conservation lands. In general, the conservation lands management programs focus on protecting the environmental resources on the properties. GridAmerica is working with these land management entities to understand their concerns and their land management objectives so that the Project design, construction and operation includes measures to avoid and minimize impacts to these important areas.

Transportation

With regard to transportation, GridAmerica will develop road and rail crossing plans and traffic management plans for the crossings to ensure the safety of motorists and minimize traffic disruption during construction. As noted previously, the use of the existing logging and construction access roads previously utilized during construction of the Quebec-New England HVDC line as well as the use of VELCO maintained maintenance roads along the existing line will minimize the need for access road impacts. During both construction and operation, GridAmerica will use the access roads within the existing Quebec-New England HVDC ROW or improve such access roads in the ROW in order to avoid the need for separate access roads off the ROW, to the extent practicable. To minimize traffic disruption, GridAmerica construction workers will park off the roadway in designated and approved parking areas.

3.9 SOCIOECONOMICS

3.9.1 Environmental Setting

Within Vermont, the GSPL Project is to be located predominately in Vermont's Northeast Kingdom which comprises Caledonia, Essex and Orleans Counties. The proposed Project crosses through Essex County and a small corner of Caledonia County. The region is very rural with 2016 estimated population densities of about 9.5 people per square mile in Essex County, 48.1 in Caledonia County and 45.2 in Orleans County 2016 [U.S. Census Bureau 2017]. Median household income in Essex County was $36,599 (2015 dollars) and over 15 percent of the population live below the poverty level. Median household income in Caledonia County was $45,323 in 2016 with about 13 percent of the population living below the poverty level [U.S. Census 2016].

Approximately 84 percent of the total land area of the Northeast Kingdom is forested [NVDA 2015]. The proposed Project is not located in or within 1 mile of any town centers or villages in Vermont. Table 3.9-1 lists total estimated 2015 population in the Vermont towns in which GSPL facilities will be located.

Table 3.9-1: Population of Towns Crossed by the Proposed GSPL Project in Vermont

Town	County, State	Population (2015 Estimated)
Norton	Essex, VT	147
UTG of Essex County[1]	Essex, VT	217
Bloomfield	Essex, VT	222
Brunswick	Essex, VT	89
Granby	Essex, VT	95
Victory	Essex, VT	88
Lunenburg	Essex, VT	1,377
Concord	Essex, VT	1,223
Waterford	Caledonia, VT	1,533

[1] The Unified Towns and Gores (UTG) of Essex County includes Averill, Avery's Gore, Ferdinand and Lewis.
Source: U.S. Census Bureau. 2011-2015 American Community Survey 5-Year Estimates

In October 2017, the unemployment rate in Essex County, Vermont was 4.5 percent, down from a high of 6.6 percent in March of 2017, but almost double that of the State's October rate of 2.3 percent. [VDLELM 2017].

In New Hampshire, the proposed Project is located entirely within Grafton County and not in or within 1 mile of any town centers or villages. The population of Grafton County was estimated at 89,341 in 2015 at an average density of about 52 people per square mile [U.S. Census Bureau 2017]. Median household income in the county was $55,762 in 2016 and approximately 10.3 percent of the population was living below the poverty level [U.S. Census 2016]. Table 3.9-2 lists the population of New Hampshire towns in which the GSPL Project is located.

Table 3.9-2: Population of Towns crossed by the Proposed GSPL Project in New Hampshire

Town	County, State	Population (2015 Estimated)
Littleton	Grafton, NH	5,929
Monroe	Grafton, NH	924

Source: U.S. Census Bureau. 2011-2015 American Community Survey 5-Year Estimates

The unemployment rate in Grafton County, New Hampshire was 2.6 percent in October 2017, slightly lower than the high of 2.9 percent in February 2017 and only slightly higher than the state's average of 2.4 percent in October [NHES 2017].

3.9.2 Impacts and Mitigation

Employment

The GSPL Project will provide significant economic benefits during both construction and operation. In Essex County, Vermont, unemployment is higher than the state average and jobs are limited. Although some construction workers are likely to be hired from outside of the immediate region, it is likely that some will be hired from the local labor pool and GridAmerica has started a campaign to identify qualified local workers (https://granitestatepowerlink.com/jobs/). Even if workers are brought in from outside of the immediate Project area, their presence will generate local benefits resulting from workers spending money in the local economy on food, gasoline, temporary living accommodations and other basic necessities. Because of the limited duration of the construction period, workers hired from outside of the project communities are unlikely to relocate their families into the area, thus avoiding impacts to area housing, schools and social services.

As noted above, the unemployment rate in Grafton County, New Hampshire is slightly higher than that of the state. Similar to Vermont, the Project is anticipated to provide benefits to New Hampshire due to local expenditures by workers. GSPL and the International Brotherhood of Electrical Workers ("IBEW") Local 104 and 490 signed a Memorandum of Understanding ("MOU"), which commits GSPL to use the highly skilled local workers in New Hampshire and New England first on the Project construction. This effort will provide significant benefits to families and businesses throughout the region.

Professional services and finance, insurance and real estate also see a significant number of direct job years. This includes labor for project engineering and design, legal counsel, management services, public relations, real estate, permitting, environmental and geophysical surveys and analysis, property rights acquisition and electrical systems studies. Local manufacturing, which includes industries that provide local materials for the project such as wood matting, gravel and concrete, is also expected to see a significant

Over the long term, the operation of the GSPL Project will provide local economic stimulus through increased property tax revenues, support of economic and community development programs, low income residential energy assistance, job creation and reduced energy costs for consumers. Operation and maintenance of the Project facilities will also result in employment of maintenance and repair technicians and vegetation management specialists.

Property Tax Revenues

Using an independent tax expert GridAmerica prepared estimates of the future property taxes that would be levied on the Project over a forty-year asset lifespan. This was calculated for the Vermont and New Hampshire towns hosting the project and by the two respective states - State of Vermont and the State of New Hampshire. Table 3.9-3 identifies approximate totals based on individual town and/or state estimates.

Table 3.9-3: Total Property Taxes Estimated to be Paid over the GSPL Project Lifespan

NH Local	NH State
$149,620,902	$54, 839,541
New Hampshire TOTAL: $204,460,443	
VT Local	**VT State**
$66,013,629	$393,810,306
Vermont TOTAL: $459,823,935	

Economic and Community Development Programs

GridAmerica has entered into a MOU with the Northeastern Vermont Development Association ("NVDA"), the Northeast Kingdom's regional economic development and planning organizations, to financially support economic and community development programs that will directly benefit the nine route communities in Vermont, as well as the broader region. This MOU was signed on December 19, 2017, and will be enacted following the Project's in-service date. Similar programs are in development for New Hampshire.

Low Income Residential Energy Assistance

Citizens Energy will provide nearly $26 million in the first 20 years for the purposes of providing energy assistance to low income families and individuals along the project route; approximately 25 percent of these funds will go to Vermont and another 25 percent to New Hampshire. Citizens Energy has a well-established program that involves taking of their investment proceeds and reinvesting them back into the GSPL communities for energy improvements such as weatherization, home heating assistance or solar projects. Citizens is working with local and state stakeholders in Vermont and New Hampshire to tailor the funding opportunity to meet local needs and to determine how to best leverage existing programs or activities to have the greatest impact.

3.10 CULTURAL AND HISTORIC RESOURCES

3.10.1 Environmental Setting

Cultural resources generally consist of prehistoric or historic architectural and archaeological resources and can include districts, sites, buildings, structures, and objects that are at least 50 years old. Cultural resources also include properties of traditional religious and cultural importance. Federally permitted actions take into account impacts to cultural resources through compliance with Section 106 of the National Historic Preservation Act ("NHPA"), as amended and re-codified (54 USC § 306108), and its implementing regulations at 36 CFR § 800. Section 106 also serves to satisfy cultural resources considerations under the National Environmental Policy Act ("NEPA"). Under Section 106, "historic properties" are defined as resources listed in or eligible for listing in the National Register of Historic Places ("NRHP'). To qualify for listing in the NRHP, resources are evaluated against a two-part test of significance and integrity (36 CFR § 800.4 (c)(1)), as specified in National Register Bulletin 15, *How to Apply the National Register Criteria for Evaluation*. Significant historic properties must meet at least one of the NRHP criterion (36 CFR § 60.4). For a significant historic resource to be eligible for listing in the NRHP, it must also possess sufficient integrity of location, design, setting, materials, workmanship, feeling, and association to convey its significance. Historic properties either retain integrity (that is, convey their significance) or they do not.

The Section 106 process provides for consultation between the federal agency official, the State Historic Preservation Officer ("SHPO"), federally recognized Native American tribes, local governments, affected property owners, individuals and organizations with a demonstrated interest in the undertaking, and the general public.

The proposed GSPL route alignment will be co-located with an existing HVDC transmission line ROW. The areas through which the proposed line will cross are rural, sparsely populated, and almost entirely forested. The line will avoid crossing though town centers. Both Vermont and New Hampshire maintain limited on-line records and GIS databases pertaining to historic resources. A review of the available online sources for both states identified five previously recorded architectural resources within a one-half-mile radius around the proposed line, listed in Table 3.10-1.

Table 3.10-1: Previously Recorded Architectural Resources					
Survey/ID No.	**Resource**	**Municipality**	**County**	**State(s)**	**Current NRHP/SRHP Status**
0503-23	Route 105 Bridge (#96) over Nulhegan River	Bloomfield	Essex	Vermont	SRHP-Listed (demolished)
0510-1	Lund House (Ralph E. Lee House)	Granby	Essex	Vermont	Unevaluated
N/A	Fifteen Mile Falls Hydroelectric Station [Upland] Historic District	Multiple	Caledonia/ Grafton	Vermont/ New Hampshire	SRHP-Eligible (NH DOE: 3/10/2010)
N/A	Moore Hydroelectric Station	Waterford/ Littleton	Caledonia/ Grafton	Vermont/ New Hampshire	Contributing to Eligible Fifteen Mile Falls Hydroelectric Station Historic District
N/A	Comerford Hydroelectric Station	Barnet/ Monroe	Caledonia/ Grafton	Vermont/ New Hampshire	Contributing to Eligible Fifteen Mile Falls Hydroelectric Station Historic District
NRHP = National Register of Historic Places SRHP = State Register of Historic Places Sources: Vermont Division of Historic Preservation("VDHP") 2017 New Hampshire Division of Historic Resources ("NHDHR") 2017					

In consultation with SHPOs, GridAmerica will be delineating the area of potential effects ("APE") and conducting cultural resource surveys in conjunction with the proposed Project. The purpose of the surveys is to review the status of previously recorded resources and record and evaluate newly identified archaeological and architectural resources 50 years or older for eligibility for listing in the NRHP. The results will be provided when available. The cultural resource evaluations will include consultation with both the Vermont and New Hampshire SHPOs and other identified consulting parties to ensure that surveys comply with Section 106 regulations and all state cultural resources survey requirements.

3.10.2 Impacts and Mitigation

Impacts to architectural historic properties can be both direct and indirect. In general, the GSPL Line will pass through undeveloped, mountainous areas with no standing structures. The heights of existing structures extend only slightly above the tops of the adjoining forest, which substantially masks their overall visibility from adjoining areas. The structures for the Project are expected to measure less than or equal to the heights of the existing structures. Accordingly, topography and vegetation, together with the diminishing effects of distance and perspective, are expected to limit potential indirect visual effects on architectural historic properties, if present, beyond the boundary of the ROW.

Along the ROW, the potential to impact archaeological resources remains small because extensive ground disturbance only occurs within and adjacent to the structure sites during installation, while the majority of the rest of the ROW experiences above-ground vegetation clearing but not soil excavation. A greater level of ground disturbance will occur with construction of the converter stations, and these areas will be evaluated during upcoming surveys. Should potentially significant resources be identified through the upcoming surveys, GridAmerica, together with the lead federal agency, will consult with the respective SHPO and any other consulting parties to determine next steps. Generally, any significant archaeological site identified through the ongoing surveys will be avoided by spanning the line over the site and moving structure locations to outside of the archaeological site boundary, when practicable. In addition, GridAmerica will have an Unanticipated Discovery Plan in place during construction that specifies the

protocols and steps to be taken in the event that construction activities uncover a previously undiscovered cultural site.

As noted above, Section 106 of the NHPA requires consultation with federally recognized Native American tribes as part of the review process. There are no federally recognized Native American Tribes resident in Vermont or New Hampshire.

As noted previously, the proposed line crosses through a rural landscape that is predominantly forested and avoids villages and town centers and generally is distant from above-ground resources. Should NRHP-listed or eligible historic properties or traditional cultural resources be identified as part of the ongoing surveys, the density of the tree cover adjacent to the line's ROW should minimize indirect visual impacts and avoid or minimize potential adverse effects to nearby historic properties, if present. Other avoidance measures may include adjustment of structure locations or other impact minimization strategies as determined appropriate through additional consultation with the appropriate SHPO.

Given the screening effects of nearby vegetation and the ability to adjust structure locations to avoid/minimize impacts, coupled with a robust Unanticipated Discovery Plan to manage any unexpected discoveries during construction, the Project is not anticipated to have significant adverse or cumulative effects on NRHP-listed or eligible historic properties.

3.11 VISUAL RESOURCES

3.11.1 Environmental Setting

The proposed GSPL Line will be co-located with the existing Quebec-New England HVDC line. The route is generally undeveloped. According to the Regional Plan for the Northeast Kingdom (2015), approximately 95 percent of Essex County and 83 percent of Caledonia County is forested, most of which is private timberland. Cropland and pasture represent only 2 percent and 7 percent of the land area in Essex and Caledonia counties, respectively. The proposed Norton Converter Station site is also forested and isolated from development.

South of the Connecticut River, the GSPL ROW in New Hampshire, also adjacent to the existing Quebec-New England HVDC line, crosses primarily forest land, as well as small sections of conservation lands associated with the hydroelectric facilities and some agricultural land. The proposed Monroe Converter Station site is forested, but near an existing substation and agricultural fields.

3.11.2 Impacts and Mitigation

The extent of potential visual impacts is a function of landscape quality, presence and proximity of aesthetic resources, number of potential viewers and the physical changes and appearance of the proposed Project. One factor that will mitigate the potential for visual impacts is the presence of the existing Quebec-New England HVDC line. The varied topography, predominant forest cover and remote setting will also limit the visual impact of the GSPL Line. Figures 3.11-1 through 3.11-3 in Exhibit F provide visual simulations showing the proposed GSPL Line adjacent to the existing Quebec-New England HVDC line in Vermont.

In Vermont, the new GSPL Line will require the additional clearing of approximately 150 feet of ROW. The extent of forest cover and the limited number of road crossings minimize the opportunities to view the existing Quebec-New England HVDC line to the few viewpoints that provide an extended view of the existing ROW, such as at road crossings. The expansion of the ROW for the GSPL Line will not add new crossings and overall, the new facilities will represent an incremental change and not a significant impact.

The proposed Norton Converter Station site in Vermont is in an undeveloped area surrounded by forest on the north, east and west sides and the existing Quebec-New England HVDC line on the west. The site is more than 1/3 mile north of Route 114, which would provide the nearest public viewing location. Considering the distance and forested land that surround the converter station site, if any portions of the facility that are visible should be limited and not dominant features in the landscape.

In New Hampshire, the proposed Monroe Converter Station site is located in a generally agricultural area near other utility facilities including existing electric transmission lines, the former HVDC converter station, and the existing Comerford Substation. The Monroe Converter Station will be located on a forested site approximately 0.2 mile from Route 135. A forested buffer will be maintained around the periphery of the site to provide screening from nearby public viewing locations. Considering the other nearby utility facilities, the distance from public viewing locations and the forested buffer between the station and public viewing locations, potential visual impacts from the Monroe Converter Station would be insignificant.

3.12 NOISE AND AIR QUALITY

3.12.1 Noise

3.12.1.1 Environmental Setting

The proposed GSPL Line will cross areas characterized as remote and generally undeveloped. According to the Northeast Kingdom Regional Plan (2015), approximately 95 percent of Essex County and 83 percent of Caledonia County is forested, most of which is private timberland. Cropland and pasture represent only 2 percent and 7 percent of the land area in Essex and Caledonia counties, respectively. South of the Connecticut River, the GSPL Line ROW in New Hampshire crosses primarily forest and some agricultural land.

The vast majority of the proposed GSPL Line will therefore be located within sparsely populated and forested areas with no nearby noise sensitive areas. None of the proposed GSPL Line within Vermont is located proximate to residential areas. Only approximately 0.05 miles of the approximately 7 miles of transmission line in New Hampshire will pass within residential areas.

The proposed Norton Converter Station is located in a forested area with the nearest residence over 600 feet away. The proposed Monroe Converter Station site is also forested, and the nearest residence is located approximately 1,500 feet away. An existing substation is located approximately 1,300 feet from the proposed Monroe Converter Station.

Existing ambient noise levels in the proposed GSPL Line and converter station areas are likely to be relatively low.

Through its orders, the Vermont Public Utilities Commission has essentially adopted World Health Organization ("WHO") guidelines for nighttime community noise limits (2009 Night Noise Guideline for Europe) of 40 decibel A-weighted ("dBA") from facility generated noise at any existing residence. The State of New Hampshire requires an assessment of operational sound associated with a proposed facility, if the facility would involve use of equipment that might reasonably be expected to increase sound by 10 dBA or more over background levels, measured at the L-90 sound level, at the property boundary of the proposed facility site or, in the case of an electric transmission line, at the edge of the ROW or the edge of the property boundary if the proposed facility, or portion thereof, will be located on land owned, leased or otherwise controlled by the applicant or an affiliate of the applicant. (N.H. Admin. Rule Site 301.08(d)(1)).

GSPL has retained a noise expert who will evaluate the potential audible operational noise of the proposed GSPL facilities relative to these standards and propose mitigation if exceedances are likely to occur.

3.12.1.2 Impacts and Mitigation

Transmission Lines

The remote and rural setting of the GSPL Project will limit the number of potential sensitive noise receptors and the related noise impacts from construction and operation of the transmission line.

Construction will require the temporary use of noise generating equipment. The construction equipment to be used is generally similar to that used during typical public works projects. Construction will result in temporary, short-term increases in noise. However, as noted above, the vast majority of the proposed transmission line will be located along existing transmission ROW in areas with few to no nearby noise sensitive uses. For the very short amount of line that will be in residential areas, increases in noise will be temporary in nature and limited to daytime hours (night construction is not anticipated), and will therefore not result in significant impacts.

Operational noise associated with the transmission lines will be limited to corona noise. During wet weather conditions (such as rain or fog), water drops collect on the conductor and increase corona activity so that a crackling or humming sound may be heard near the line, when ambient noise is not otherwise dominated by the sounds of rainfall. This audible noise from the line can barely be heard in fair weather conditions on higher voltage lines. Modern transmission and power lines have been designed, and are constructed and maintained, to generate a minimum of corona-related noise. The proposed GSPL Line will be located adjacent to existing ROWs where transmission lines are currently present. As such, the existing noise environment currently contains corona noise and the installation of additional transmission lines is not anticipated to significantly alter existing environmental noise characteristics.

Norton and Monroe Converter Stations

Construction

The construction process for the converter stations will generally include the following phases:

- Excavation
- Foundation Construction
- Building Construction
- Restoration/Finishing

Heavy equipment (bulldozers, loaders, dump trucks, cement mixers) will be used during excavation and concrete pouring activities. Construction equipment utilized differs in each phase, but in general, noise is generated by the diesel engines that power the equipment. Exhaust noise is usually the predominant source of diesel engine noise, and this noise source can be mitigated through the use of functional mufflers on all equipment during construction.

Project construction equipment and resulting noise will not be unusual, and will be typical of that associated with any residential and commercial construction project. The construction equipment will not generally be operated continuously, or simultaneously. There will be times when no equipment is operating and noise will be at ambient levels. GSPL anticipates that construction activities will be scheduled to occur primarily during daytime hours, when many people are at work and away from home.

Operation

The converter station will include noise generating equipment sources during operation. In general, the main sound sources are:

- Converter transformers;
- Cooling fans for transformer coolers;
- IGBT valves;
- Converter reactors;
- DC filter equipment;
- AC filter equipment;
- Valve Coolers (fans) for valve cooling system; and
- Climate control and ventilations equipment for the station buildings.

The project will be retaining the services of a noise consultant to assist in designing the converter stations. The converter station noise control and mitigation measures will be designed to ensure that the station meets applicable state noise standards. Noise control measures are available for all of the sources that will be present at the site, and noise mitigation measures will be utilized to minimize the potential for impacts at noise sensitive uses in the area. Based on the noise consultant's recommendations, some or all of the following may be implemented as required:

- Enclosures for the transformer tanks;
- Low noise design for the cooling fans for the valve cooling system;
- Acoustically treated walls and roof for the station building(s);
- Installing sources such as the IGBT valves and DC filters inside buildings;
- Low noise AC filter components;
- Acoustically treated ventilation openings for the converter building; and
- Strategic placement of outdoor sources.

3.12.2 Air Quality

3.12.2.1 Environmental Setting

The GSPL Project will be located within Vermont and northern New Hampshire. The climate in this area of the northeast U.S. exhibits cold winter temperatures, hot summers and ample precipitation throughout the year with significant annual variation in precipitation amounts year-to-year.

The U.S. Environmental Protection Agency ("USEPA") has promulgated National Ambient Air Quality Standards ("NAAQS") to protect human health and welfare. The NAAQS include primary standards that are designed to protect human health, including the health of sensitive subpopulations such as children and those with chronic respiratory problems. The NAAQS also include secondary standards designed to protect public welfare, including economic interests, visibility, vegetation, animal species, and other concerns not related to human health.

The NAAQS currently apply to the following criteria pollutants: particulate matter ("PM") with a nominal aerodynamic diameter of 10 microns or less ("PM_{10}"); PM with a nominal aerodynamic diameter of 2.5 microns or less ("$PM_{2.5}$"); sulfur dioxide ("SO_2"); nitrogen dioxide ("NO_2"); CO; ozone ("O_3"); and lead ("Pb"). Each NAAQS is expressed in terms of a concentration level and an associated averaging period.

The NAAQS apply in all Project areas. States may adopt standards that are more stringent than the NAAQS. The entire Project region located in Vermont and northern New Hampshire is in attainment of all EPA NAAQS as well as State Ambient Air Quality Standards in Vermont and New Hampshire. That is, the existing air quality within the Project region with respect to all federally and state regulated pollutants meets the applicable air quality standards.

The GSPL Project may require a quantitative evaluation of operational emissions from sources of regulated pollutants such as the intermittent emissions from an emergency generator with comparison to applicable state and federal standards. Such an evaluation would determine whether certain permitting thresholds would be met and ultimately have as a goal to demonstrate that the GSPL Project would not cause or contribute to an exceedance of any state or federal air quality standard.

3.12.2.2 Impacts and Mitigation

Indirect pollutant and greenhouse gas emissions linked to transmission lines are typically those associated with the power plant(s) providing energy to the line and importing regions. Since the exporting power source to the GSPL Project is exclusively from clean, renewable generation sources, energy importing regions will have a potential net air pollutant and greenhouse gas emissions reduction as local fossil-fuel fired generation will be offset by the renewable energy carried by GSPL. Thus, indirect pollutant and greenhouse gas emissions within importing communities are anticipated to experience a net reduction due to anticipated offsetting of fossil-fuel fired generation dependency within importing communities. In this way, the GSPL Project offers significant benefit by allowing importing communities to avoid emissions of greenhouse gases by fossil-fuel fired generation.

Direct air quality impacts associated with the GSPL Project construction are anticipated to be minimal and transient. Direct construction-related, temporary impacts will be limited to fugitive dust, vehicle exhaust, and possible use of temporary portable concrete batch plants or rock crushers during the construction period. Direct emissions during the operational phase will be limited to vehicle exhaust and dust during infrequent maintenance activities such as inspections and vegetation management as well as intermittent emissions from emergency generators that will operate under state air permits.

Overall, the GSPL Project, having only minimal construction and operational emissions as well as a net benefit by way of avoided fossil-fuel fired emissions, is anticipated to not cause or contribute to a negative impact on ambient air quality.

3.13 REFERENCES

References (3.2 Geology and Soils):

Soil Data Viewer, Natural Resource Conservation Service.

SSURGO Data. Soil Survey Staff, Natural Resources Conservation Service. United States Department of Agriculture.

Vermont ANR Open Data Portal.

References (3.3 Water Resources):

Vermont Agency of Natural Resources (VANR) 2017. Vermont Agency of Natural Resources Watershed Management Division – Basin 17 Lake Memphremagog, Tomifobia, and Coaticook Tactical Basin Plan. November 2017.

Vermont Agency of Natural Resources (VANR) 2014. Vermont Agency of Natural Resources Watershed Management Division – Passumpsic and Upper Connecticut River Tactical Basin Plan, June 2014.

Vermont Agency of Natural Resources (VANR) 2012. Vermont Agency of Natural Resources – Basin 17 Water Quality Management Plan. January 2012.

Vermont Agency of Natural Resources (VANR) 2011. Vermont Agency of Natural Resources – Northern Connecticut River and Direct Tributaries - Basin 16 Water Resources, Water Quality, and Aquatic Habitat Assessment Report. March 2011.

Vermont Agency of Natural Resources (VANR) 2009. Vermont Agency of Natural Resources – Passumpsic River Watershed Water Quality and Aquatic Habitat Assessment Report. June 2009.

References (3.4 Wetlands):

Calhoun, A. J. K. and M. W. Klemens. 2002. Best development practices: Conserving pool-breeding amphibians in residential and commercial developments in the northeastern United States. MCA Technical Paper No. 5, Metropolitan Conservation Alliance, Wildlife Conservation Society, Bronx, New York

Flood ReadyState of Vermont. (n.d.). Retrieved November 28, 2017, from http://floodready.vermont.gov/flood_protection/river_corridors_floodplains/river_corridors

Thompson, E. H., & Sorenson, E. R. 2000, 2005. Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont (Vermont Department of Fish and Wildlife). Lebanon, NH: The Nature Conservancy and Vermont Department of Fish and Wildlife.

Vermont Wetland Rules VT Code R. 12 004 056 (1990). (Amendments adopted January 26, 2017, Effective April 1, 2017

References (3.5 Wildlife):

Andrews, Jim, 2007, *Native Vermont Amphibians Part 2: Salamanders* (color poster with descriptive text, and photographs): Montpelier: Vermont Dept. of Fish and Wildlife.

Audubon. 2017a. Important Bird Areas in New Hampshire. Accessed November 30, 2017. at www.audubon.org/important-bird-areas/state/new-hampshire

Audubon. 2017b. Important Bird Areas: Nulhegan Basin IBA. Accessed November 30, 2017. at http://www.audubon.org/important-bird-areas/victory-bog-basin-iba

Audubon. 2017c. Important Bird Areas: Victory Bog Basin IBA. Accessed November 30, 2017. at http://www.audubon.org/important-bird-areas/nulhegan-basin-iba

Audubon Vermont. 2017. Important Bird Areas in Vermont. Accessed November 30, 2017. at http://vt.audubon.org/conservation/important-bird-areas-vermont

Grund, S., Walberg, E. 2013. *Climate Change Adaptation on New England Conservation Lands*. Manomet Center Conservation Sciences, Plymouth, MA.

Marchand, M. 2016. *Identifying and Documenting Vernal Pools in New Hampshire.* 3rd ed. New Hampshire Fish and Game Department, Nongame and Endangered Wildlife Program. New Hampshire Fish and Game Department.

NCED. 2017. National Conservation Easement Database. Accessed 11/2017 at: https://www.conservationeasement.us/

N.H. Fish and Wildlife Department, 2017. Habitat Types and Species. Retrieved November 30, 2017, from http://www.wildlife.state.nh.us/habitat/types.html

N.H. Natural Heritage Bureau – NHB Datacheck Results Letter. December 8, 2017. From Amy Lamb, NH Natural Heritage Bureau

Sorenson and Thompson, 2000. Wetland, Woodland, Wildland: a Guide to the Natural Communities of Vermont

Thompson, E. H., & Sorenson, E. R. (2005). *Wetland, woodland, wildland: a guide to the natural communities of Vermont.* Montpelier: Vermont Dept. of Fish and Wildlife and the Nature Conservancy.

United States Department of Agriculture, Vermont Natural Resources Conservation Service. (2007). *Wildlife Habitat Incentives Program 2007 Plan*

United States Department of Agriculture, Natural Resources Conservation Service. 2010. American Woodcock: Habitat Best Management Practices for the Northeast by Scot J. Williamson. Wildlife Insight. Washington, DC.

United States Department of Agriculture. 2014. Changing Climate, Changing Forests: The Impacts of Climate Change on Forests of the Northeastern United States and Eastern Canada. General Technical Report NRS-99. Forest Service. Newtown Square, Pennsylvania.

United States Fish and Wildlife Service. 2017. Silvio O. Conte National Fish & Wildlife Refuge: Wildlife & Habitat. Accessed November 30, 2017. at https://www.fws.gov/refuge/Silvio_O_Conte/wildlife_and_habitat/index.html

VANR. 2004. Guidelines for the Conservation and Protection of State-Significant Natural Communities. Accessed November 30, 2017. at http://anr.vermont.gov/sites/anr/files/co/planning/documents/guidance/VFWD%20Natural%20Community%20Conservation%20Guidelines%2010-21-2004.pdf

VANR. 2017. Vermont Protected Lands Database. Vermont Open Geodata portal. Accessed 11/2017 at: http://geodata.vermont.gov/datasets/072bb8ad3c454b0e9cb0f517e9a296a3_10

Vermont Center for Ecostudies: Vermont Atlas of Life. 2017. Bald Eagle (*Haliaeetus leucocephalus*). Accessed November 30, 2017, at http://val.vtecostudies.org/projects/vermont-breeding-bird-atlas/bald-eagle/

Vermont Institute of Natural Science. 2000. A Breeding Bird Survey of the West Mountain Wildlife Management Area and the Nulhegan Basin Division of the Silvio O. Conte National Fish and Wildlife Refuge 2000 Final Report J. Daniel Lambert Vermont Institute of Natural Science 27023 Church Hill Rd. Woodstock, VT 05091

VFWD, (n.d.). American Woodcock. Retrieved December 1, 2017, from http://www.vtfishandwildlife.com/cms/One.aspx?portalId=73163&pageId=145241

VT DFPR. 2017. Victory Management Unit Long Range Management Plan. State of Vermont, Agency of Natural Resources Department of Forests, Parks, and Recreation, Fish & Wildlife Department. 12/1/2016.

VT DFPR, VFWD (1990). Management Guide For Deer Wintering Areas in Vermont. Montpelier: State of Vermont, Agency of Natural Resources Department of Forests, Parks, and Recreation, Fish & Wildlife Department.

Wildlife Management Institute, 2010. Implementing the American Woodcock Conservation Plan: Progress to Date. Retrieved December 1, 2017, from https://timberdoodle.org/sites/default/files/Woodcock_Conservation_Progress_Report-070610.pdf

References (3.6 Fisheries):

New Hampshire Fish and Game Department. 2009. *New Hampshire Stream Crossing Guidelines.* University of New Hampshire.

Recreation Riverbend Subcommittee- Executive Summary (Rep.). (n.d.). Connecticut River Joint Commissions.

Vermont Department of Environmental Conservation, Watershed Management Division. (2014). *Passumpsic and Upper Connecticut River Tactical Basin Plan*. Vermont Agency of Natural Resources.

Vermont Department of Environmental Conservation. 2011. *Northern Connecticut River and Direct Tributaries, Basin 16, Water Resources, Water Quality, and Aquatic Habitat Assessment Report*.

Vermont Fish and Wildlife Department. (2016). *Vermont Stream Crossing Handbook*. Vermont Agency of Natural Resources.

References (3.8 Land Use):

Northeastern Vermont Development Association. Northeast Kingdom Regional Plan. Accessed November 30, 2017. http://www.nvda.net/regional-plan.php

U.S. Fish and Wildlife Service. Silvio O. Conte National Fish & Wildlife Refuge. Accessed November 29, 2017. https://www.fws.gov/refuge/silvio_o_conte/

U.S. Forest Service. Cow Mountain Pond. April 1993 Accessed December 19, 2017 at. https://www.na.fs.fed.us/legacy/legacy_places/vt/pdfs/vt_04_1993p.pdf

Vermont Community Forests. Town Forests. Accessed November 30, 2017 at: https://vtcommunityforestry.org/places/town-forests

Vermont Fish and Wildlife Service. West Mountain Wildlife Management Area. Accessed December 19, 2017 at: http://www.vtfishandwildlife.com/UserFiles/Servers/Server_73079/File/ Where%20to%20Hunt/St.%20 Johnsbury%20District/West%20Mountain%20WMA.pdf

VTFPR. Forest Legacy Program. Vermont Department of Forests, Parks and Recreation Accessed November 28, 2017. http://fpr.vermont.gov/state_lands/acquisition/forest_legacy)

References (3.9 Socioeconomics):

NHES. 2017. New Hampshire Local Area Unemployment Statistics. New Hampshire Employment Security, Economic & Labor Market Information Bureau. Released 11/22/2017. Accessed at: https://www.nhes.nh.gov/elmi/statistics/documents/laus-current.pdf

NVDA. 2015. Regional Plan for the Northeast Kingdom. Northeastern Vermont Development Association. 2015.

U.S. Census Bureau. 2017. Quick Facts. Caledonia and Essex Counties, Vermont and Grafton County, New Hampshire. Accessed 11/29/2017 at https://www.census.gov/quickfacts/fact/table/caledoniacountyvermont,essexcountyvermont,VT/SBO001212.

U.S. Census Bureau 2017. Quick Facts. Income and Poverty estimates. July 1, 2016 (v2016). Accessed 11/3-/2017 at: https://www.census.gov/quickfacts/fact/table/essexcountyvermont,US#viewtop

VDLM. 2017. Local Area Unemployment Statistics. Not Seasonally Adjusted – 13 Months through October 2017. Vermont Department of Labor, Economic and Labor Market Information. September 20, 2017.

References (3.10 Cultural):

National Park Service (NPS). 2002. National Register Bulletin No. 15, *How to Apply the National Register Criteria of Evaluation*, US Department of the Interior, National Park Service, Washington, D.C.

New Hampshire Division of Historical Resources. 2017. Project and Historic District Area Forms List (August 16, 2017). Electronic document, https://www.nh.gov/nhdhr/programs/documents/areas.pdf, accessed September 26, 2017.

New Hampshire Division of Historical Resources. 2015. Project Review & Compliance > Native American Organizations with Geographical / Cultural Interests in New Hampshire. Accessed at https://www.nh.gov/nhdhr/review/tribal_list.htm. 11/15/2017.

Vermont Commission on Native American Affairs. 2017. State Recognized Tribes. Accessed at http://vcnaa.vermont.gov/recognition/recognized-tribes. 11/16/2017.

Vermont Division of Historic Preservation. 2017. File Records, Vermont Division of Historic Preservation Online Resource Center. Electronic document, https://orc.vermont.gov/Resource/Show-Resource-Table.aspx, accessed September 26, 2017.

4.0 ALTERNATIVES ANALYSIS

This section includes an analysis of practical alternatives to the proposed GSPL Project including a discussion of potential environmental impacts for each alternative.

4.1 CRITERIA FOR ROUTE SELECTION AND CONVERTOR STATION LOCATIONS

GridAmerica's criteria for selecting the route to bring the wind power from Canada into the Northeast transmission system, including the locations of the converter stations, was based on mix of practical, technological and environmental considerations. To bring the power from the wind generation assets in Quebec, GridAmerica looked for a major substation close to the generation assets and with access to the 735 kV transmission line on the Quebec transmission system. The Des Canton substation in Canada met this criteria. GridAmerica then searched for existing transmission line corridors that could take advantage of the benefits of co-location and bring the proposed GSPL Line into the U.S. while avoiding the impacts of an entirely new transmission line corridor. For the converter stations, GridAmerica determined that it was necessary to locate both stations in the U.S., due to differences in procurement requirements in Canada and the U.S. and the need to ensure the alignment of converter station technology. It was also necessary to maximize the use of HVDC technology between the converter stations in order to avoid losses and maximize energy delivery. Finally, GridAmerica looked for the closest major substation interconnection point to the Northeast transmission system to terminate the DC line in order to minimize the overall length of the project and associated impacts while maximizing energy delivery into the regional transmission system.

Based on these criteria, GridAmerica selected Norton, Vermont for the northern converter station, given its proximity to the border and the existing Quebec-New England HVDC line. This location allowed GridAmerica to leverage the existing HVDC ROW corridor to a termination point in Monroe, New Hampshire, which is the closest major substation that could be utilized to interconnect to the regional transmission system.

In addition to consideration of alternative converter station sites in Norton, Vermont and Monroe, New Hampshire, GSPL considered underground installation and alternative routes for the proposed GSPL Line, including expansion of the existing Quebec-New England HVDC line ROW to the west side rather than the east side, as proposed.

4.2 CONVERTER STATION ALTERNATIVES

Although the AC electric grid of the Quebec Interconnection and the Eastern Interconnection (which includes New England) operate at 60 Hertz, they are not synchronized and can only be joined using HVDC ties. As a result, two new converter stations are required for operation of the proposed GSPL Project. Rather than have the northern converter station across the border in Canada, an early decision was made to construct both converter stations in the U.S. to avoid the risk that vendors for each converter station would be different, which would create insurmountable technical issues for the Project. Additionally, the Canadian procurement process occurs later and GSPL needs to know the vendor for the converter stations early in the process in order to feed inputs to ISO-NE studies. With the decision made to construct both converter stations in the U.S., placement of the northernmost station in Norton, Vermont, just on the U.S. side of the U.S./Canada border was identified as optimal to maximize DC line length in the U.S. to minimize energy losses.

4.2.1 Norton Converter Station Site Alternatives

Three potential sites were identified for siting the Norton Converter Station (the proposed site and two alternate sites). All three sites are located between Vermont Route 114 and the U.S./Canada border in the town of Norton, Vermont. Figure 4.1-1 in Exhibit F shows the location and boundaries of the three sites. Alternative sites 1 and 2 are on the west side of the existing Quebec-New England HVDC line ROW, while the proposed site is on the east side. All three sites are under the same ownership.

Reconnaissance surveys of the three alternative sites were conducted in June 2017 to assess cultural and historic resource sensitivity and the presence of wetlands. A review of the Vermont Division for Historic Preservation ("VDHP") site files identified no previously recorded archaeological sites or historic architectural resources within 1 mile of the alternative sites. The reconnaissance survey indicated that the three alternative sites contain low sensitivity for the presence of unrecorded archaeological sites. The conclusion is that none of the alternative sites would have been an attractive setting for long-term prehistoric period hunter-gatherer camps, and that the area's sensitivity for the presence of significant historic period archaeological resources is low. Accordingly, historical resource sensitivity is not a distinguishing factor for any of the sites.

None of the three sites (proposed and alternatives) contain public lands, deer wintering yards, previously documented National Register historic sites (listed or eligible for listing), residential land, agricultural land, streams, or navigable waterways. Based on published data, no rare, threatened or endangered plants or animals occur on the sites.

All of the sites are forested. Only the Alterative 2 site contains wetlands (0.23 acre), however given the site's size, it is likely that the small area of wetlands could be avoided by careful site layout. While the two alternative sites are considerably larger than the proposed site, it is assumed that only a portion of each site would be required if it was used for the converter station. Overall, the three sites are comparable in potential environmental impact. The major benefit of the Proposed site is that it is located on the east side of the proposed GSPL Line and would not require the proposed Line to cross over the existing transmission lines.

4.2.2 Monroe Converter Station Site Alternatives

The early search for a site for a converter station in Monroe, New Hampshire focused on the area near the former converter station for the Quebec-New England HVDC line, particularly those parcels transected by the existing Quebec-New England HVDC line ROW that are owned by NEP. Three potential sites were identified within an approximately 265-acre area owned by NEP. Figure 4.1-2 in Exhibit F shows the locations of the three sites considered for the Monroe Converter Station (the proposed site and two alternate sites). The Proposed site and Alternative 1 site are located on the south side of the existing transmission line ROW and Alternative 2 is on the north side. The parcels lie on a gently sloping terrace above the impounded Connecticut River with elevations that range from 760 feet to 900 feet above mean sea level ("amsl").

The proposed site is located closest to the existing NEP substation (less than ¼ mile). None of the three sites contains FEMA mapped floodplain, public lands, residential land, agricultural land, or navigable waterways. Several streams run through Alternative 1 site. No major highways, local roads or railroads cross or abut any of the sites. Although wetlands are present in the area, no NWI mapped wetlands occur within any of the sites. All three of the sites are forested.

Reconnaissance surveys of the alternative parcels for the Monroe Converter Station site were conducted in May 2017 to assess cultural and historic resource sensitivity and the presence of wetlands. A review of the

New Hampshire Division of Historical Resources ("NHDHR") site files identified no previously recorded archaeological sites within 1 mile of the NEP property in New Hampshire. A review of the VDHP site files identified five previously recorded, historic period archaeological sites in Vermont within 1 mile of the parcels; all five of these archaeological sites have been determined by VDHP to be not eligible for listing on the NRHP. Reviews of state files and the NRHP database identified no historic architectural properties within 1 mile of the proposed Monroe Converter Station sites that are listed on the NRHP nor on the New Hampshire or Vermont State Registers. Reconnaissance survey identified three zones of high archaeological sensitivity for the presence of prehistoric sites within the portion of the property that contains Alternative site 2. These zones consist of upland terraces overlooking Scarritt Brook, a low-order tributary of the Connecticut River. A zone of high sensitivity for the presence of historic period sites was delineated near a ruined farm outbuilding and associated historic dump. Presumably, these relatively small areas of potential archaeological sensitivity could be avoided during final siting and layout of the Monroe Converter Station if Alternative site 2 were to be chosen for development.

Overall, the three sites are comparable from an environmental perspective. Alternative 2 was dropped due to high archaeological sensitivity for prehistoric sites and Alternative 1 was less desirable due to the presence of multiple streams. As a result, the proposed site was chosen for development of the Monroe Converter Station.

4.2.3 GSPL Line Corridor Selection

4.2.3.1 Routing Process

GridAmerica analyzed alternative corridors to identify and compare potential transmission line corridors. The primary objective was to find as direct a route as possible from Norton, Vermont to Monroe, New Hampshire that minimized potential environmental impacts through co-location along existing ROWs.

Based upon the system interconnection area along the U.S./Canada shared border and the proposed interconnection point in Monroe, New Hampshire, the geographic scope for alternative routes was defined to allow adequate area to identify multiple corridor options that would be practical for transmission line development while avoiding key resources between the northern interconnection area and the interconnection point in Monroe, New Hampshire. The analysis accepted that the crossing could be made from any location along the U.S./Canada border in the study area. Figure 4.1-3 in Exhibit F shows the boundaries of the study area.

The GSPL alternatives analysis involved the desktop mapping of various environmental and infrastructure data to provide a general understanding of the suitability or constraint criteria that may be associated with routing corridors of a new transmission line. Preliminary corridors were developed and refined based on the results of desktop data collection and mapping, definition of the study area that tried, to the extent possible, to co-locate with existing ROW and a desire to avoid sensitive environmental resources. Through this process two alternative corridors were identified, an Eastern Alternative and the Proposed Alternative. The two alternative corridors are shown on Figure 4.1-3.

4.2.3.2 Corridor Alternatives Analysis

Proposed Alternative (and East Edge vs. West Edge Alignments)

The 59.1-mile-long Proposed Alternative begins at the Norton, Vermont border with Canada and parallels the existing Quebec-New England HVDC line to the interconnection point in Monroe, New Hampshire. The entire Proposed Alternative would be co-located with the existing Quebec-New England HVDC line

ROW. While it would cross more forested land than the Eastern alternative (See Table 4.2-1), unlike the other alternative this clearing would represent an incremental expansion of an existing ROW and not the establishment of an entirely new corridor where none currently exists. Furthermore, the existing Quebec-New England HVDC ROW has associated existing roads that were developed and used during the construction of the line, many of which continue to be utilized for operations and maintenance today and are very well maintained. This alternative avoids residential neighborhoods or areas and is not within 500 feet of any residences. It also requires the fewest road crossings, but crosses more public lands (26.5 linear miles). In general, the development of the GSPL Line in the Proposed Corridor through the public lands would expand edge and open habitat but, given the abundance of forest throughout the region, animals that occur in these areas would likely move into other forested areas without significant impact. Under this alternative, there would not be new fragmentation of habitat unlike the Eastern Alternative in which new greenfield corridors would be required. Table 4.2-1 provides a comparison of resources crossed by the Proposed and Eastern Alternatives.

Table 4.2-1: Alternative Corridors Comparison

	Eastern	Proposed
Total Length (miles)	59.9	59.1
Percent of Corridor Co-located with existing linear facilities[1]	18%	100%
Forested Land (miles crossed)	48.8	55.6
Cultivated land (miles crossed)	0.4	0.5
NWI Wetlands (miles crossed)	0.5	1.4
Open Water (miles crossed)	0.1	0.3
RTE and Significant Natural Communities (miles crossed	4.2	2.9
Deer Wintering Areas (miles crossed)	4.7	0.0
Number of Residences within 500 feet of centerline	53	0
Federal and State Lands (miles Crossed)	0.6	26.5
Number of Public Road Crossings	32	25

As part of the review of the Proposed Alternative both the east and west adjacent sides of the existing ROW were considered for the GSPL Line. Expanding the existing Quebec-New England HVDC line to the west side would encounter essentially the same resources and constraints as found on the adjacent east side. Accordingly, one of the more significant early siting decisions for the proposed GSPL Line – assuming expansion of the existing ROW – was whether the proposed line would be located to the east or west side of the existing HVDC line. Expansion to the east side of the existing ROW was selected as the preferred option after consideration of the potential siting opportunities for the Monroe Converter Station. Both of the proposed converter station sites are on the east side of the existing ROW; hence, locating the proposed GSPL Line on the adjacent east side of the existing Quebec-New England HVDC line will avoid the need for the two lines to cross one another.

Eastern Alternative

The Eastern Alternative is approximately 60 miles long. It begins in Norton, Vermont at the same location as the Proposed Alternative and travels southeast for approximately 14 miles toward the Connecticut River. The corridor then heads south generally along the west side of the Connecticut River until south of Brunswick, Vermont where it turns south and west toward Lunenburg, from which point it follows U.S. Highway 2 west to meet the existing Ontario-New England HVDC line ROW.

While the Eastern Alternative would avoid more public lands than the Proposed Alternative, only about 18 percent of the Eastern Alternative is co-located with existing linear facilities, indicating that it would require the creation of approximately 50 miles of new ROW through previously undisturbed areas whereby every resource area and habitat would be bisected by a 200-foot clearing and the placement of the towers and cables. This alternative would have a greater impact on significant natural communities in Vermont (4.2 linear miles crossed versus 2.9 miles crossed by the Proposed Alternative) and would also cross 4.7 linear miles of deer wintering areas (no deer wintering areas occur in the Proposed Alternative). Being a new ROW, an unknown number of new off ROW construction access roads would also need to be built, further disturbing forested habitats, creating the potential for sedimentation and erosion, and creating clearings visible within the landscape. As a result, project development along the Eastern Corridor would cause fragmentation of previously undisturbed wildlife habitat, vegetation cover, and the general landscape, with future on-going vegetation management practices maintaining a field and shrub type vegetation cover.

In addition to environmental impacts, the Eastern Alternative centerline is within 500 feet of 53 residences. While direct impact to residences could be avoided through careful placement of towers, it would be virtually impossible to avoid visual impacts. In contrast, there are no residences within 500 feet of the Proposed Alternative.

Alternative Corridor Conclusions

The two alternative corridors each have positive and negative characteristics for transmission line routing. Because it would be an expansion of an existing ROW, development of the Proposed Alternative would not cause habitat fragmentation. It also avoids deer wintering areas. In contrast, while avoiding public lands (state/federal forests and wildlife protection areas) as noted in Table 4.2-1, only about 18 percent of the Eastern Corridor Alternative is co-located with existing corridors and unlike the Proposed Alternative, does not avoid residential areas. As a result, about 50 miles of the Eastern Alternative would be entirely new ROW through previously undeveloped or disturbed lands. In these previously undeveloped areas, every resource area and habitat would be bisected by a 200-foot clearing and the placement of the towers and cables causing habitat fragmentation and all the associated adverse fauna and flora effects of such fragmentation, a new visual disruption of forested landscapes, and the potential for increased human access along the ROW.

The Eastern Alternative would also require the development of numerous new access roads while the Proposed Alternative will require very few, if any. While direct impact to residences and structures could be avoided by careful placement of Project structures, routing the line through developed areas is challenging at best and visual impacts would be nearly impossible to avoid.

On balance, the Eastern Alternative offers no clear advantage over the Proposed Alternative, particularly if added weight is given to the avoidance of developed areas and the creation of a virgin ROW. Considering the fewer acres of impact associated with an expanded ROW (150-feet-wide) versus a new ROW (200-feet-wide), the avoidance of creating a new virgin ROW and associated access roads, the advantages of the Proposed Alternative with the expansion of the existing ROW become evident.

4.2.4 Underground Installation

Underground installation of the proposed GSPL Line was considered during the early phase of Project development but was eliminated as impractical at the conceptual design stage for a number of reasons. Initially, underground installation of the proposed GSPL Line entirely within the existing ROW was considered as a way to avoid or minimize the need for additional ROW; however, due to the clearances that must be maintained between the existing energized conductors and the construction equipment that would

be used for trench excavation and cable installation, it was estimated that at least 30 feet of additional ROW width would be needed to locate and install the proposed HVDC line underground, partially negating the initial perceived advantage of underground installation within the existing ROW. In addition, due to the thin veneer of till in the region, the exposed bedrock surfaces, and the type of bedrock present along the ROW, multiple trenching techniques would be required and the likelihood that blasting would be required also increases along with the need to deal with excess blast rock. In some till areas, trenching could be completed with:

- Conventional excavation with a backhoe
- Ripping with a dozer followed by backhoe excavation
- Hammering with a backhoe attachment followed by backhoe excavation

Where the till layer is thin and igneous and metamorphic bedrock is at or near the surface, conventional trenching techniques would not be possible and blasting or rock ripping would be required to support trenching activities. Several areas, such as the Connecticut River crossing, could require the use of specialized construction techniques such as horizontal directional drilling, adding to the cost of installation. Even the aesthetic benefits of underground construction would be limited given the presence of the existing Quebec-New England HVDC line and the need to maintain additional cleared ROW over the new buried line. Furthermore, an overhead transmission line can often avoid or span areas of environmental sensitivity whereas trenching an underground line would require trench excavation along the entire length of the ROW. In this respect, underground cable installation is more similar to buried pipeline construction methods and equipment, which result in continuous disturbed earth surface for the entire length of the project, with more cut and fill requirements resulting in temporary soil stockpiling and subsequent potential for erosion and sedimentation.

Additionally, an underground installation is not a practical alternative when taking cost into account. A report issued by the Edison Electric Institute, *Out of Sight, Out of Mind, 2012 – An Updated Study on the Undergrounding of Overhead Power Lines* (EEI 2012) presents several salient facts based on actual utility experience:

- New underground construction can be five to ten times more expensive than new overhead construction;
- Underground utility systems take longer and cost more, both to install and to repair; and
- Geographic areas with severe frost and rocky conditions can increase costs significantly.

Taking all these factors into account, underground installation of the proposed GSPL Line is not considered a practical alternative for the GSPL Project.

4.3 REFERENCES

References (Section 4)

Edison Electric Institute [EEI]. 2012. Out of Sight, Out of Mind, 2012 – An Updated Study on the Undergrounding of Overhead Power Lines. Prepared by Kenneth L. Hall of Hall Energy Consulting, Inc.

National Register of Historic Places (NRHP). 2017. NPGallery Digital Asset Search. Electronic document https://npgallery.nps.gov/nrhp, accessed May 18, 2017. National Park Service.

U.S. Department of Energy (USDOE). 1984. New England/Hydro-Quebec ±450 kV Direct Current Transmission Line Interconnection, Final Environmental Impact Statement. January 1984.

Vermont Division for Historic Preservation (VDHP). 2017. Online Resource Center. Electronic Document, http://www.orc.vermont.gov/Resource/Show-Resource-Table.aspx, accessed June 19, 2017.

5.0 AGENCY ACTIONS, REGULATORY APPROVALS AND OUTREACH

5.1 REGULATORY OVERVIEW

The GridAmerica team has decades of experience successfully designing, siting, constructing, and commissioning large and complex transmission line and substation projects while complying with all federal, state, regional, and local zoning and permitting requirement.

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

Tables 5.2-1, 5.3-1 and 5.3-2 outline all potentially applicable federal, state and local permitting approvals for the GSPL.

5.2 FEDERAL AUTHORIZATIONS AND APPROVALS

Table 5.2-1: Potentially Required Federal Permits, Approvals or Review

Law/Regulation	Regulatory Agency	Permit/License	Action Requiring Permit, Approval or Review
Section 404 of the Clean Water Act (33 U.S.C. 1344)	U.S. Army Corps of Engineers ("USACE")	Individual Permit (or NH PGP), depending on extent and nature of resource impacts	Applicable if the project impacts Waters of the U.S., including wetlands.
Section 10 of the Rivers and Harbors Act (33 U.S.C. 403)	USACE		
16 U.S.C. §1531	U.S. Fish and Wildlife Service ("USFWS")	Endangered Species Act Consultation	Applicable if project may affect federally listed threatened and/or endangered species and critical habitats.
36 CFR 251.50	U.S. Forest Service ("USFS")	Special Use Authorization	Applicable when project crosses USFS land; granted for a specific use for a specific period of time
16 U.S.C. §668dd(b)(3)	USFWS	Land Exchange	Exchange of land required for the ROW expansion for equivalent and adjacent land
14 CFR Part 77	Federal Aviation Administration ("FAA")	Determination of No Hazard	Applicable when project may penetrate regulated air space
40 CFR Part 122 – NPDES	U.S. Environmental Protection Agency ("USEPA")	NPDES Individual Discharge Permit (or Construction GP)	Applicable for Project discharge of uncontaminated water form construction activity.

5.3 VERMONT AND NEW HAMPSHIRE AUTHORIZATIONS AND APPROVALS

Table 5.3-1: Potentially Required Vermont State/Local Permits, Approvals, or Reviews

Law/Regulation	Regulatory Agency	Permit/License	Action Requiring Permit, Approval or Review
30 V.S.A. Section 248	Vermont Public Utility Commission	Certificate of Public Good	Applicable for utility or cable projects
30 V.S.A. Section 231	Vermont Public Utility Commission	Certificate of Public Good	Applicable for company that owns or operates transmission facilities
Vermont Wetland Rules (Vt. Code R. 12 004 056)	Vermont Agency of Natural Resources - Department of Environmental Conservation ("VANR-DEC")	Individual Vermont Wetland Permit	Applicable if project may alter state wetland resource areas.
Clean Water Act Section 401	VANR-DEC	Water Quality Certification	Applicable if project may discharge into a navigable water including all wetlands, watercourses, and natural and man-made ponds.
10 V.S.A. Section 47 / Clean Water Act Section 402 (40 C.F.R. Part 123)	VANR-DEC	Individual Permit for Stormwater Discharges Associated with Construction Activity ("INDC")	Applicable if project will involve stormwater discharge from construction and construction related activities.
Stormwater Management Rule (10 V.S.A. Section 1263 and Section 1264)	VANR-DEC	General Permit 3-9015 - Stormwater Discharges from New Development (INDS) (Norton Converter Station)	Applicable if project will involve stormwater discharge from construction and construction related activities to waters that are not Stormwater impaired
Stream Alteration Rule (10 V.S.A. Chapter 165)	VANR-DEC	Vermont Stream Alteration Permit	Applicable if project will involve the movement, excavation, or fills involving 10 or more cubic yards annually in any perennial stream.
Vermont Air Pollution Control Regulations Sections 5-401	VANR-DEC	Construction (Air Permit) & Compliance with USEPA emission requirements	Applicable if project will produce air emissions
Vermont Flood Hazard Area and River Corridor Rule (10 V.S.A. Section 754)	VANR-DEC	Flood Hazard Area and River Corridor Permit	Applicable if project is located within a flood hazard area or river corridor
Vermont Endangered Species Act (10 V.S.A. Section 5408)	VANR-F&W	Endangered Species Take Permit	Applicable if project may result in incidental take of a state-listed threatened or endangered species
10 V.S.A. Section 4607	VANR-F&W	Stream Obstruction Permit	Applicable if project involved construction of dam, obstruction or the change of a river/streams course, current or cross section.
Section 106 of National Historic Preservation Act & Vermont Historic Preservation Act (22 V.S.A. Section 723(10)	VT Division for Historic Preservation	Historic and Archeological Clearance (Completed as an Agency to Agency consultation with CWA 404 Permit)	Required to determine if project may affect historical or archaeological resources.
19 V.S.A. Section 1111	Vermont Agency of Transportation ("AOT/VTrans")	VTrans State Highway Access and Work Permit (1111 Permit)	Applicable if project involves access to a state highway

Table 5.3-2: Potentially Required New Hampshire State/Local Permits, Approvals, or Reviews			
Law/Regulation	**Regulatory Agency**	**Permit/License**	**Action Requiring Permit, Approval or Review**
NH RSA 162-H:5.I	NH Site Evaluation Committee ("SEC")	Certificate of Site and Facility	Applicable for certain energy facility development projects.
NH RSA 374:26	NH Public Utilities Commission ("PUC")	Approval to Operate as a Public Utility	Applicable to public utilities as defined in NH RSA 362:2,I
NH RSA 485-A:12, III and IV Env-Wq 1700	NH Department of Environmental Services ("NHDES")	Individual or General NHDES Water Quality Certification	Applicable for projects involving federal license or permit that may discharge into navigable waters, including wetlands, triggering required state certification that discharge complies with state surface water quality standards applicable to the classification of the receiving water body.
NH RSA 482-A, Env-Wt 100-900	NHDES	NH Wetlands Permit	Applicable if project excavates, removes, fills, dredges or constructs any structures in or on any bank, flat, marsh or swamp in and adjacent to any waters of the state, including surface waters, banks, shores and wetlands.
NH RSA 485-A:17, Env-Wq 1500	NHDES	Alteration of Terrain Permit	Applicable if project significantly alter the characteristic of the terrain or undertake construction in or on the borders of state surface waters, including more than 50,000 square feet of disturbance within protected shoreland or more than 100,000 square feet of disturbance outside of protected shoreland.
NH RSA 483-B, Env-Wq 1400	NHDES	NH Shoreland Impact Permit	Applicable if project involves excavation, fill, or construction activities within 250 feet of public waters of the state, including lakes and ponds greater than 10 acres in size, rivers or streams which are fourth order or greater, rivers designated under RSA-483, and tidal waters.
NH RSA 483:12-a	NHDES Rivers Coordinator; Local River Management Advisory Committee	River Advisory Committee Notification, Review and Comment on State Action Affecting Designated Rivers	Required notice and comment to CT River advisory committee to determine if proposed activity is consistent with character of the designated river or segment.
NH RSA 212-A NHFG FIS 1000	NH Fish and Game Department ("NHFG")	Project Review for state-listed rare, threatened and endangered wildlife species and habitats	Required to determine to if project may impact state-listed rare, threatened or endangered wildlife.
NH RSA 217-A	NH Natural Heritage Bureau ("NH NHB")	Project Review for state-listed endangered/rare plants and natural exemplary communities/habitats	Required to determine if project may impact state-listed endangered/rare plants and natural exemplary communities/habitats
Section 106 of the National Historic Preservation Act, NH RSA 227-C	NH Division of Historical Resources ("NHDHR")	Historic and Archeological Clearance (completed through Federal and SEC processes and associated agency to agency consultation)	Required to determine if project may affect historical or archaeological resources.

Table 5.3-2: Potentially Required New Hampshire State/Local Permits, Approvals, or Reviews			
Law/Regulation	**Regulatory Agency**	**Permit/License**	**Action Requiring Permit, Approval or Review**
NH RSA 371:17	PUC	License to cross public land and waters	Applicable if project will cross public land or waters.
NH RSA 125-C	NHDES	General Air Permit to Operate	Applicable if project exceeds thresholds for fuel burning devices or utilizes rock crushing equipment.
NH RSA Chapters 231, 236 NHDOT Utilities Accommodation Manual	NH Department of Transportation ("NHDOT")	Aerial Crossing Permit/Use & Occupancy Agreement/Excavation and Encroachment Permits	Applicable to aerial installations crossing certain highways
Town Master Plan & Zoning Ordinance	Town of Monroe	Project review and comment (SEC process pre-empts local siting authority. *See Public Service Company of NH v. Town of Hampton,* 120 NH 68 (1980). However, SEC must give due consideration to views of municipal and regional planning commissions, and municipal governing bodies. RSA 162-H:16, IV(b).).	
	Town of Littleton		

5.4 AGENCY COORDINATION

Federal, state and local agencies and non-governmental organizations ("NGOs") continue to receive updates about the Project through in-person meetings and phone, mail and email communication. Table 5.4-1 outlines the meetings held on the Project.

Table 5.4-1: GSPL Federal, State and Local Meetings Held	
Agency Coordination. Municipalities	**State**
• Vermont: Bloomfield, Brunswick, Concord, Granby, Lunenburg, Norton, Victory, Waterford and Unified Towns and Gores • New Hampshire: Littleton and Monroe	• Vermont Agency of Natural Resources • Vermont Governor's Office • Vermont Department of Public Service • Key state legislators in Vermont and New Hampshire Governor's Office • New Hampshire Office of the Consumer Advocate • New Hampshire Department of Environmental Services • New Hampshire Division of Cultural and Historical Resources
Non-Governmental Organizations ("NGO")/Environmental	**Federal**
• Northeastern Vermont Development Association • Conservation Law Foundation • Vermont Association of Snow Travelers • Nature Conservancy • New England Forestry Foundation • Vermont Land Trust • Vermont Housing & Conservation Board • Society for the Protection of NH Forests • Appalachian Mountain Club • Northern Community Investment Corporation • Business & Industry Association of NH • Sierra Club • Vermont Traditions Coalition • Vermont Natural Resources Council • New England Ratepayers Association • New Hampshire Community Action Program agencies	• U.S. Department of Energy • U.S. Fish & Wildlife Service • U.S. Forest Service • U.S. Environmental Protection Agency • U.S. Department of Interior • U.S. Army Corps of Engineers • White House Council on Environmental Quality • Vermont and New Hampshire Congressional Delegations

5.5 PUBLIC OUTREACH AND PUBLIC BENEFITS

Public outreach and engagement is central to the development philosophy of the GSPL Project team. GridAmerica and the GSPL Project team are committed to timely, accurate and consistent information sharing. Because of the Project merits, approach, and on-the-ground efforts in Vermont and New Hampshire, positive feedback from the public has already been received and the GSPL Project has garnered support from a diverse and growing group of elected officials, organizations, and individuals.

Continued and regular stakeholder engagement is vital to advancing the GSPL Project in a cooperative and minimally impactful manner. The GSPL team is focused on building trust by maintaining a regular two-way dialogue with all stakeholders and will encourage all feedback to incorporate into a successful Project for the region.

Stakeholders for the GSPL Project include:

- Landowners and abutters;
- community leaders;
- local, state and federal agencies and government officials (See Table 5.4-1 above);
- NGOs including business, environmental, homeowners and others; and
- others as identified.

Elected officials, municipalities, non-profits, and residents alike are drawn to GSPL because of the Project's minimal impact and maximum benefits to communities along the route, as well as the clean wind generation profile of the Project. Local decision-makers, thought leaders and the public alike recognize the value that GSPL offers:

- Lower overall cost compared to similar projects;
- Adjacent to or within existing transmission corridors, limiting environmental and viewshed impacts;
- Reuse of existing infrastructure and assets thereby limiting view and environmental impacts and lowering development costs;
- New, clean Canadian wind generation supply to significantly reduce the region's greenhouse gas emissions;
- Local economic stimulus through increased property tax revenues, support of economic and community development programs, low income residential energy assistance (Citizens Energy), job creation and reduced energy costs for consumers; and
- Commitment to a long-term partnership with GridAmerica/National Grid.

A dedicated public engagement team is committed to proactively engaging, informing, and responding to affected communities and landowners/abutters, as well as interested organizations and individuals. This on-the-ground team will foster two-way communication with project stakeholders throughout the life of the Project. The GSPL Project team has deep experience developing and building transmission projects. This experience is leveraged in building and maintaining positive relationships with affected communities and landowners/abutters during the Project process. The current phase of the plan is focused on Project education, soliciting local feedback and building partnerships – much of which is featured in other outreach phases as well.

5.5.1 Public Outreach Initiatives to Date

GridAmerica has undertaken extensive outreach efforts since the public launch of GSPL in March 2017, in accordance with a comprehensive stakeholder outreach and communications plan that covers project development through operations. In this short time frame, GridAmerica has targeted grassroots and grasstops stakeholders and held briefings; conducted one-on-one meetings; presented to Boards of Selectmen and Town/City Councils, state and federal legislators, NGOs and interest groups; hosted community public meetings; and, touched all project landowners and abutters with various outreach efforts in order to provide wide-reaching education and feedback opportunities on the project and the development, permitting, and construction process.

The Project is committed to open, transparent and regular communication to ensure public participation is woven into all activities, and the response has been very favorable. In addition to the support letters received, Exhibit H highlights some of the public quotes on the project, which focus on the critical need and preference for the project from a diverse group of stakeholders in the region. Exhibit H features positive comments on social media regarding GSPL. GSPL has received positive feedback from the public and have garnered support from a diverse and growing group of elected officials, organizations, and individuals (See Exhibit H).

The Project also maintains strong support from organized labor through the local International Brotherhood of Electrical Workers ("IBEW"), representing labor interests in New England. GSPL and IBEW signed an MOU, which commits GSPL to use the highly skilled local workers in New Hampshire and New England first on the project construction. The MOU commits to signing a project labor agreement ("PLA") to require contractors and subcontractors on the Project to recognize the IBEW as the sole and exclusive bargaining representative of the employees who perform covered work to be defined. It also acknowledges the need for a PLA to, at a minimum, establish wage rates, hiring events, union security provisions, and dispute resolution processes to maintain harmonious working environments. This effort will provide significant benefits to families and businesses throughout the region.

To date, the following outreach activities have been completed or are in progress:

- **Project Public Educational Campaign**. The stakeholder engagement plan is centered around a multi-media educational campaign to creatively and directly communicate with project stakeholder through all methods – in-person, virtually, mail, phone blasts, local and regional media, and social media. The outreach team has conducted over 300 meetings and briefings, as well as frequent correspondence with a variety of project stakeholders, including federal, state, local and municipal officials and governmental bodies, and non-governmental and non-profit organizations and groups. The team has presented to all town of Vermont Select boards along the route and all New Hampshire select boards/city or town councils along the route. The team will continue to build out the campaign as the project advances. The Table 5.5-1 below lists our current outreach statistics since launch.

Table 5.5-1: GSPL Outreach Statistics Since March 2017 Launch to December 2017

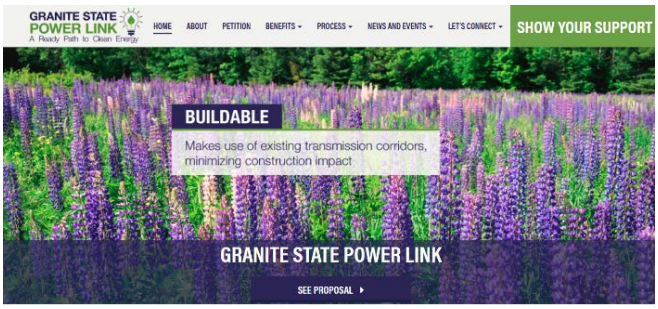
Type of Outreach	Total
In-person Meetings and Briefings	310
Public attendance at municipal presentations	Approximately 250
Community Meetings (open houses) Listening Sessions & Roundtable Discussions	11 (covering all VT project towns and 50 percent of NH project towns)

Table 5.5-1: GSPL Outreach Statistics Since March 2017 Launch to December 2017	
Type of Outreach	**Total**
Community Meeting attendees	Approximately 290
Inquiries via hotline or email	51
Unique website visitors	1,757
GSPL Media Coverage	172, reaching a total readership of over 14 million

Examples of Outreach include:

- **Virtual Project Information Toolbox**. GSPL has a dedicated project website (www.GraniteStatePowerLink.com), Twitter (@GSPowerLink), email account (info@GraniteStatePowerLink.com), and toll free hotline (1-855-603-GSPL) to make continuous communication easy and immediate. These tools will serve as a useful way to gather stakeholder input and provide ways to share project milestones. Any method to allow an informed, productive dialogue will be pursued by the outreach team.

- **User-Friendly Website**



- **Collateral Material**. The Project boasts a catalogue of collateral material to educate and inform stakeholders on key Project aspects. The core components are a Project fact sheet, a wind generation fact sheet, Frequently Asked Questions ("FAQs"), maps, customized PowerPoint presentations and infographics.

- **Comprehensive Database**. Maintaining accurate records of public interaction is important to identify and address areas of weakness or problem. The team has established a web-based database to track project interactions, feedback and areas of follow up. This has aided in project design and will support GSPL construction efforts, and operations and maintenance into the future.

- **Public Community Meetings**. The GSPL team has hosted community public meetings in all towns traversed by the route in Vermont and New Hampshire. A community roundtable was held in Norton, Vermont to discuss questions surrounding possible converter station location and route alignment. A second round of public community meetings will be scheduled prior to filing state siting applications. Listening sessions were also held on the project (11/17/17 Littleton, New Hampshire and 12/12/17 St. Johnsbury, Vermont) to take feedback on key issues. The team continues to conduct regular community check-ins.

Listening Session in Littleton, NH – November 17, 2017

- **Landowner/Abutter Outreach.** The team is focused on prioritizing landowner/abutter outreach to ensure that they are integrated into all project activities and providing feedback that will improve the project outcomes. Communication has begun through mailed letters and postcards, as well as door-to-door canvassing along the route. This will continue throughout each phase and milestone of the project.

Vermont Traditions Coalition Champion Lands Camp Owners Meeting – October 7, 2017

- **Partnership Building.** Securing local and regional partners will help ensure the project's success and will provide additional benefit for the communities and their businesses and residents. As mentioned above, GridAmerica has signed an MOU with the local IBEW 104, pledging to use local labor first for construction. This will have dramatic impacts to local families, businesses and overall economy in New Hampshire and Vermont. GridAmerica continues to work with regional economic development organizations to identify opportunities that will improve existing business and community programs in some hard hit areas. GSPL also announced a partnership with the NVDA, the regional planning and economic development entity that represents the project route towns and region. The NVDA-GSPL partnership will facilitate economic development and job creation in the Northeast Kingdom of Vermont. To expand partnership opportunities and raise general project awareness, GSPL team members regularly exhibit at local tradeshows and relevant conferences and events.

5.5.2 Public Benefits

Local and Regional Economic Development and Job Creation. GSPL will stimulate the local and regional economies throughout Vermont and New Hampshire through increased tax revenues, the creation of direct and indirect jobs during construction, access to new regional economic and community development programs via partnerships with economic development organizations, and assistance to low income families from Citizens Energy.

Energy Cost Savings. GSPL will deliver low cost, clean energy to the region, thereby stabilizing and diversifying the regional supply thereby lowering prices. This cost savings will be realized by all New England customers, which will positively impact economic development opportunities.

Citizens Energy will provide nearly $26 million in the first 20 years for the purposes of providing energy assistance to low income families and individuals along the project route; approximately 25 percent of these funds will go to Vermont and another 25 percent to New Hampshire. Citizens Energy has a well-established program that involves taking of their investment proceeds and reinvesting them back into the GSPL communities for energy improvements such as weatherization, home heating assistance or solar projects. Citizens is working with local and state stakeholders in Vermont and New Hampshire to tailor the funding opportunity to meet local needs and to determine how to best leverage existing programs or activities to have the greatest impact.

Environmental Stewardship. GSPL takes great care in protecting natural resources and environmentally sensitive areas. By utilizing existing transmission corridors and assets, the project will have minimal environmental and viewshed impacts. Also, the Project's provides options to improve wildlife protection and enhance indigenous habitats and recreational offerings. Additionally, the Project will transport clean, renewable wind energy from Canada, which will reduce carbon emissions annually through the region and begin to transform the energy profile in New England.

5.5.3 Schedule

The schedule for the GSPL Project is provided in Exhibit I.

6.0 VERIFICATION

GridAmerica's Verification is provided in Exhibit J.

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

EXHIBIT A

Opinion of Counsel

GRIDAMERICA HOLDINGS INC.

OPINION OF COUNSEL

I, Timothy E. McAllister, a lawyer licensed to practice in Massachusetts, acting as counsel to GridAmerica Holdings Inc. (the "Company"), do hereby state and give my opinion pursuant to 10 C.F.R. § 205.322(a)(6), as follows:

1. I have examined and am familiar with the Company's Certificate of Incorporation and Bylaws;

2. I have examined and am familiar with the contents of the Company's Application for Presidential Permit, to which this Opinion is attached as an Exhibit;

3. I am of the opinion that the construction, operation, or maintenance of the proposed facilities, as described in such Application, are within the corporate power of the Company as set out in the Company's Certificate of Incorporation and Bylaws; and

4. The Company has complied with, or will comply with, all pertinent federal and state laws related to the construction, operation or maintenance of the proposed Granite State Power Link Project.

In rendering the above opinions, I have examined and relied as to certain matters upon such certificates, corporate and public records, agreements and instruments, as well as information obtained from public officials, officers of GridAmerica Holdings Inc., and such other sources as I have deemed appropriate as a basis for the opinions expressed herein. I have assumed that the signatures on all documents examined by me are genuine, assumptions which I have not independently verified. As to any facts that are material to the opinions herein expressed that I did not independently establish or verify, I have relied without investigation upon certificates of officers of the Company.

My opinion in paragraph 4 above is qualified to the best of my knowledge and, as to the Company's future compliance with applicable laws, is premised solely on the statement of a responsible officer of the Company that the Company intends to continue to comply with such laws. As used in this opinion letter, "to my knowledge," "known to me" or words of similar import means my actual knowledge, without independent investigation.

The opinions expressed herein are limited to the facts known and the laws in effect on the date hereof only, and I expressly disclaim any obligation to revise, update or supplement such opinions should any facts or laws upon which such opinions are based change after the date hereof, or should any facts or circumstances come to our attention after the date hereof.

I am furnishing this Opinion solely for your benefit in connection with the Application. This Opinion may not be relied upon by you for any other purpose or relied upon by or furnished to any other person without my express written consent.

Dated December 20, 2017

Timothy E. McAllister

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

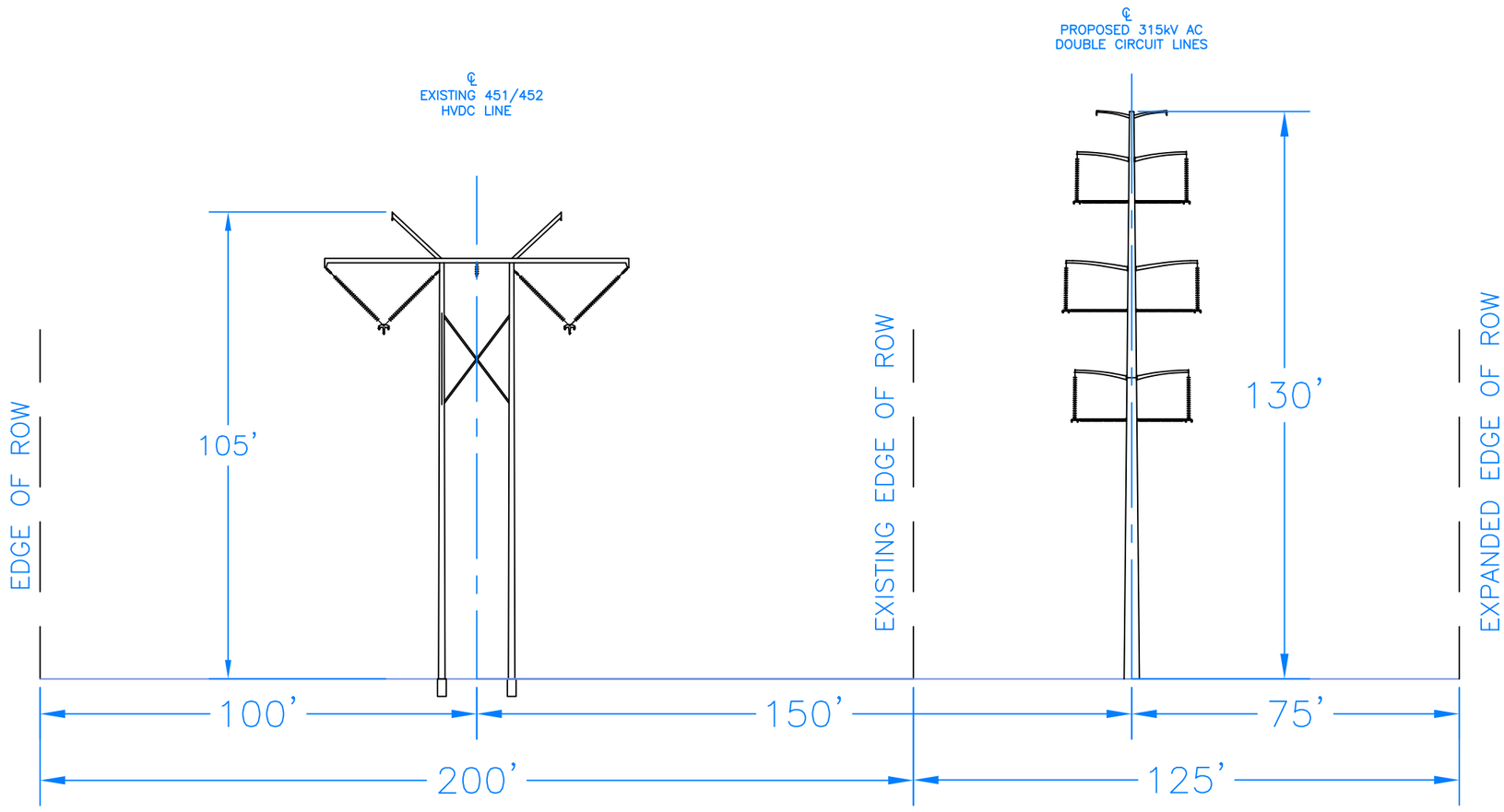
EXHIBIT B

Drawings of Typical Structure Configurations

900007-C-X-10-P

VERSION	PREPARED	REVIEWED	APPROVED
1			

VER	DATE	VERSION DESCRIPTION
0	06/14/2017	PRELIMINARY – ISSUED FOR OUTREACH & INITIAL PERMITTING
1	12/18/2017	UPDATED PER PROJECT INPUT FROM TRANSENERGIE – ISSUED FOR PERMITTING
2		
3		



EXISTING 200' WIDE CORRIDOR – FEE & EASEMENT – VELCO
EXPAND CORRIDOR 125' FOR NEW AC LINES
USA/CANADA BORDER TO MILE 0.5
FACING COMERFORD
PROPOSED CONFIGURATION

NOTES:
1. ALL INFORMATION PRESENTED IS CONCEPTUAL AND SUBJECT TO CHANGE BASED ON ADVANCEMENT OF ENGINEERING.
2. STRUCTURE HEIGHTS DEPICTED ARE AN AVERAGE AND WILL VARY ON A SPAN BY SPAN BASIS.
3. NEW STRUCTURES TO BE SELF-WEATHERING STEEL WITH BROWN PORCELAIN OR GLASS INSULATORS.

GRANITE STATE POWER LINK

PREPARED BY	JTF	60/14/2017
REVIEW BY		
APPROVED BY		
SCALE	NTS	
SHEET	1 OF 1	
INDEX	900007	

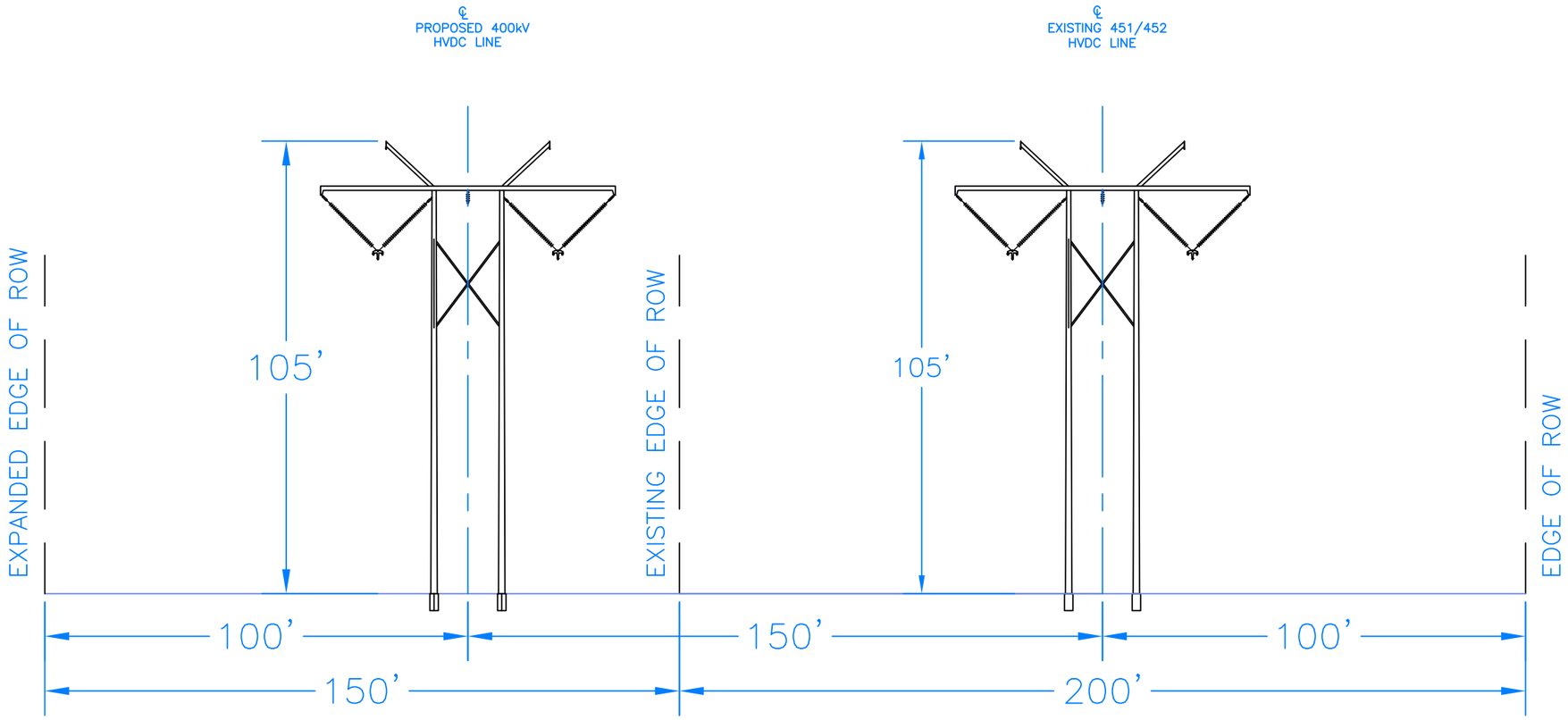
FIGURE 2-1
CROSS-SECTION
GRANITE STATE POWER LINK
NEW OVERHEAD 315kV AC LINES
US/CANADA BORDER TO MILE 0.5

INCHES ON ORIGINAL

900007-C-X-10-P

900007-C-X-11-P

VER	DATE	VERSION DESCRIPTION	PREPARED	REVIEWED	APPROVED	VERSION
0	06/14/2017	PRELIMINARY – ISSUED FOR OUTREACH & INITIAL PERMITTING				1
1	12/18/2017	UPDATED PER PROJECT INPUT FROM TRANSENERGIE – ISSUED FOR PERMITTING				
2						
3						



EXISTING 200' WIDE CORRIDOR – FEE & EASEMENT – VELCO
EXPAND CORRIDOR 150' FOR NEW DC LINE
MILE 0.5 TO MILE 46.65
FACING COMERFORD
PROPOSED CONFIGURATION

NOTES:
1. ALL INFORMATION PRESENTED IS CONCEPTUAL AND SUBJECT TO CHANGE BASED ON ADVANCEMENT OF ENGINEERING.
2. STRUCTURE HEIGHTS DEPICTED ARE AN AVERAGE AND WILL VARY ON A SPAN BY SPAN BASIS.
3. NEW STRUCTURES TO BE SELF-WEATHERING STEEL WITH BROWN PORCELAIN OR GLASS INSULATORS.

GRANITE STATE POWER LINK

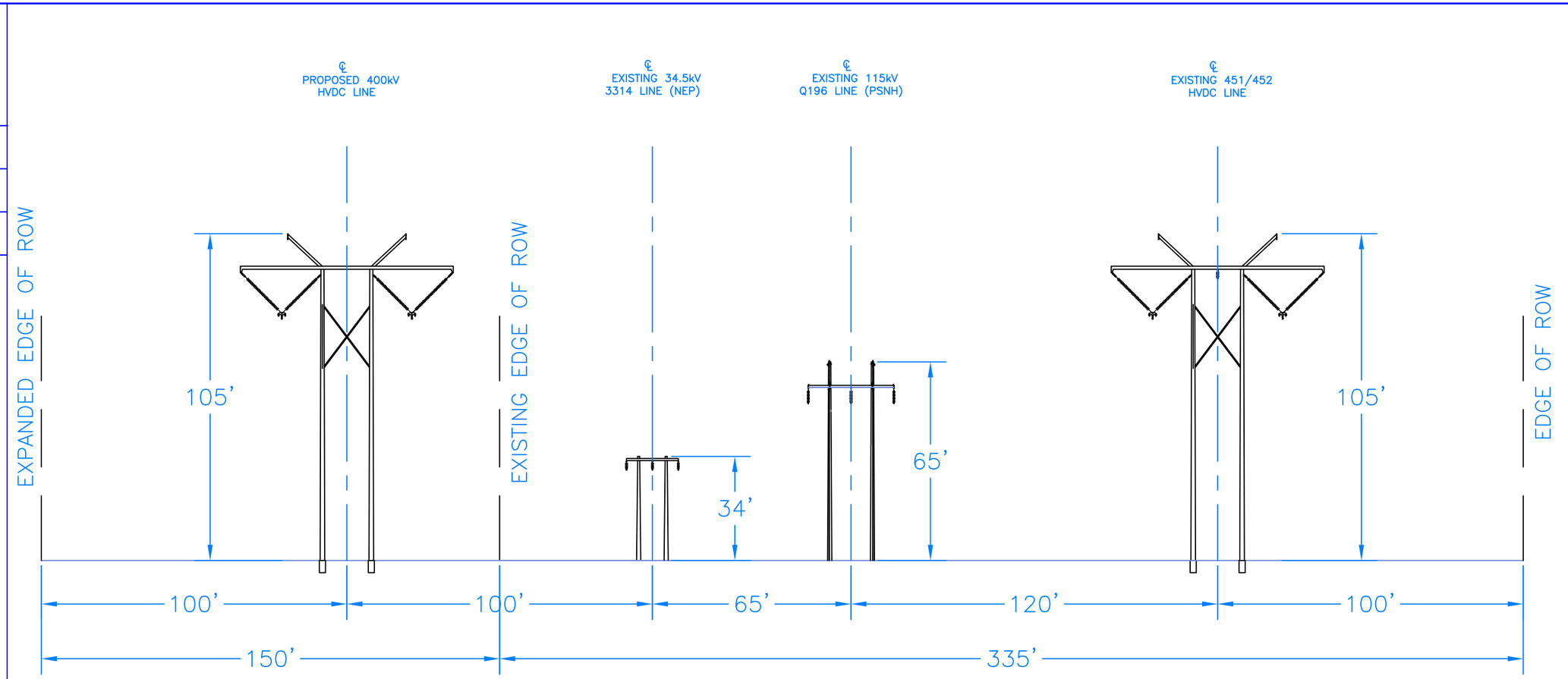
PREPARED BY	JTF	60/14/2017	
REVIEW BY			
APPROVED BY			
SCALE	NTS		
SHEET	1 OF 1		
INDEX	900007		

FIGURE 2-2
CROSS-SECTION
GRANITE STATE POWER LINK
NEW 400kV HVDC LINE
MILE 0.5 TO MILE 46.65

INCHES ON ORIGINAL

900007-C-X-11-P

900007-C-X-12-P



EXISTING 335' WIDE POWER LINE CORRIDOR – FEE & EASEMENT
EXPAND ROW 150'
MILE 46.65 TO MILE 52.15
FACING COMERFORD
PROPOSED CONFIGURATION

NOTES:
1. ALL INFORMATION PRESENTED IS CONCEPTUAL AND SUBJECT TO CHANGE BASED ON ADVANCEMENT OF ENGINEERING.
2. STRUCTURE HEIGHTS DEPICTED ARE AN AVERAGE AND WILL VARY ON A SPAN BY SPAN BASIS.
3. NEW STRUCTURES TO BE SELF-WEATHERING STEEL WITH BROWN PORCELAIN OR GLASS INSULATORS.

VER	DATE	VERSION DESCRIPTION
0	06/14/2017	PRELIMINARY – ISSUED FOR OUTREACH & INITIAL PERMITTING
1	12/19/2017	UPDATED PER PROJECT INPUT FROM TRANSENERGIE – ISSUED FOR PERMITTING
2		
3		

	VERSION	APPROVED	REVIEWED	PREPARED
	1			

GRANITE STATE POWER LINK

PREPARED BY	JTF	06/14/2017
REVIEW BY		
APPROVED BY		
SCALE	NTS	
SHEET	1 OF 1	
INDEX	900007	

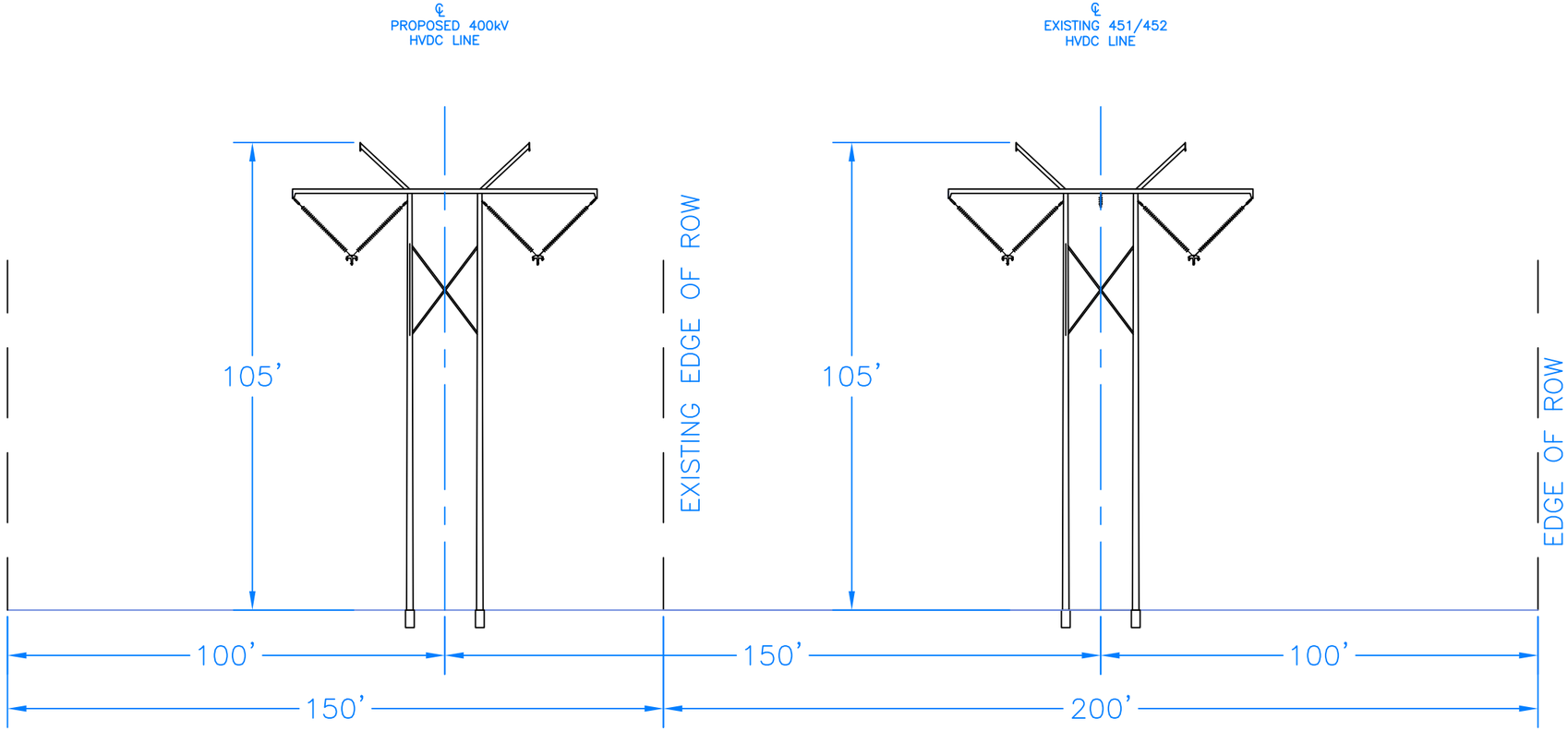
FIGURE 2-3
CROSS-SECTION
GRANITE STATE POWER LINK
NEW OVERHEAD 400kV DC LINE
MILE 46.65 TO MILE 52.15

PRINTED COPIES ARE NOT DOCUMENT CONTROLLED. FOR THE LATEST AUTHORIZED VERSION, PLEASE REFER TO THE ENGINEERING DEPARTMENT DOCUMENTS CABINET IN DOCUMENTUM.
PRINTED – MAY 16, 2017

INCHES ON ORIGINAL

900007-C-X-12-P

900007-C-X-13-P



200' WIDE CORRIDOR – FEE & EASEMENT – VELCO/NEP
EXPAND ROW 150'
MILE 52.15 TO MILE 53.17
FACING COMERFORD
PROPOSED CONFIGURATION

NOTES:
1. ALL INFORMATION PRESENTED IS CONCEPTUAL AND SUBJECT TO CHANGE BASED ON ADVANCEMENT OF ENGINEERING.
2. STRUCTURE HEIGHTS DEPICTED ARE AN AVERAGE AND WILL VARY ON A SPAN BY SPAN BASIS.
3. NEW STRUCTURES ARE TO BE SELF-WEATHERING STEEL WITH BROWN PORCELAIN OR GLASS INSULATORS.

VER	DATE	VERSION DESCRIPTION
0	06/14/2017	PRELIMINARY – ISSUED FOR OUTREACH & INITIAL PERMITTING
1	12/19/2017	UPDATED PER PROJECT INPUT FROM TRANSENERGIE – ISSUED FOR PERMITTING
2		
3		

	VERSION	APPROVED	REVIEWED	PREPARED
	1			

GRANITE STATE POWER LINK

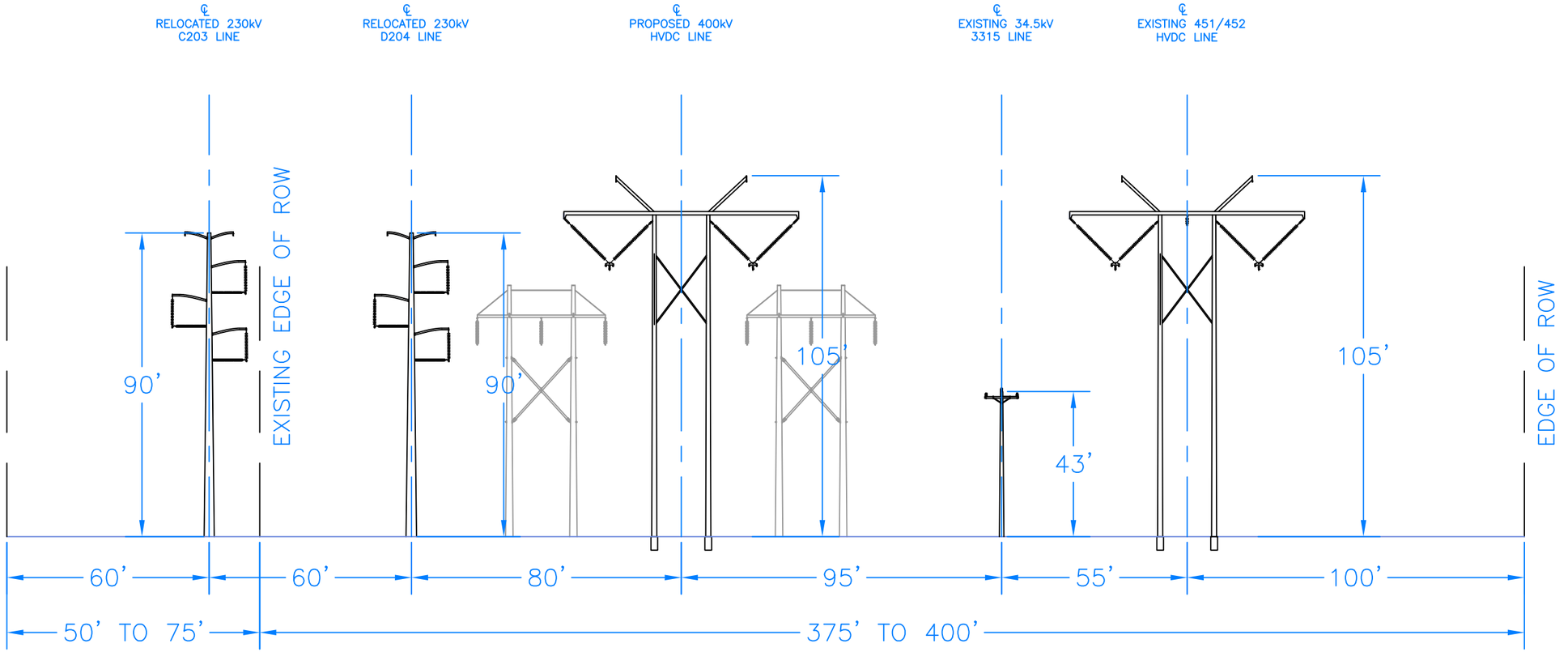
PREPARED BY	JTF	06/14/2017
REVIEW BY		
APPROVED BY		
SCALE	NTS	
SHEET	1 OF 1	
INDEX	900007	

FIGURE 2-4
CROSS-SECTION
GRANITE STATE POWER LINK
NEW OVERHEAD 400kV DC LINE
MILE 52.15 TO MILE 53.17

INCHES ON ORIGINAL

900007-C-X-13-P

900007-C-X-14-P



375' WIDE CORRIDOR – FEE & EASEMENT – NEP
EXPAND ROW 75'
MILE 53.17 TO MILE 58.23
FACING COMERFORD
PROPOSED CONFIGURATION

NOTES:
1. ALL INFORMATION PRESENTED IS CONCEPTUAL AND SUBJECT TO CHANGE BASED ON ADVANCEMENT OF ENGINEERING.
2. STRUCTURE HEIGHTS DEPICTED ARE AN AVERAGE AND WILL VARY ON A SPAN BY SPAN BASIS.
3. NEW STEEL POLE STRUCTURES TO BE WEATHERING STEEL WITH BROWN PORCELAIN OR GLASS INSULATORS.

VER	DATE	VERSION DESCRIPTION
0	06/14/2017	PRELIMINARY – ISSUED FOR OUTREACH & INITIAL PERMITTING
1	12/19/2017	UPDATED PER PROJECT INPUT FROM TRANSENERGIE – ISSUED FOR PERMITTING
2		
3		

VERSION	1
APPROVED	
REVIEWED	
PREPARED	

GRANITE STATE POWER LINK

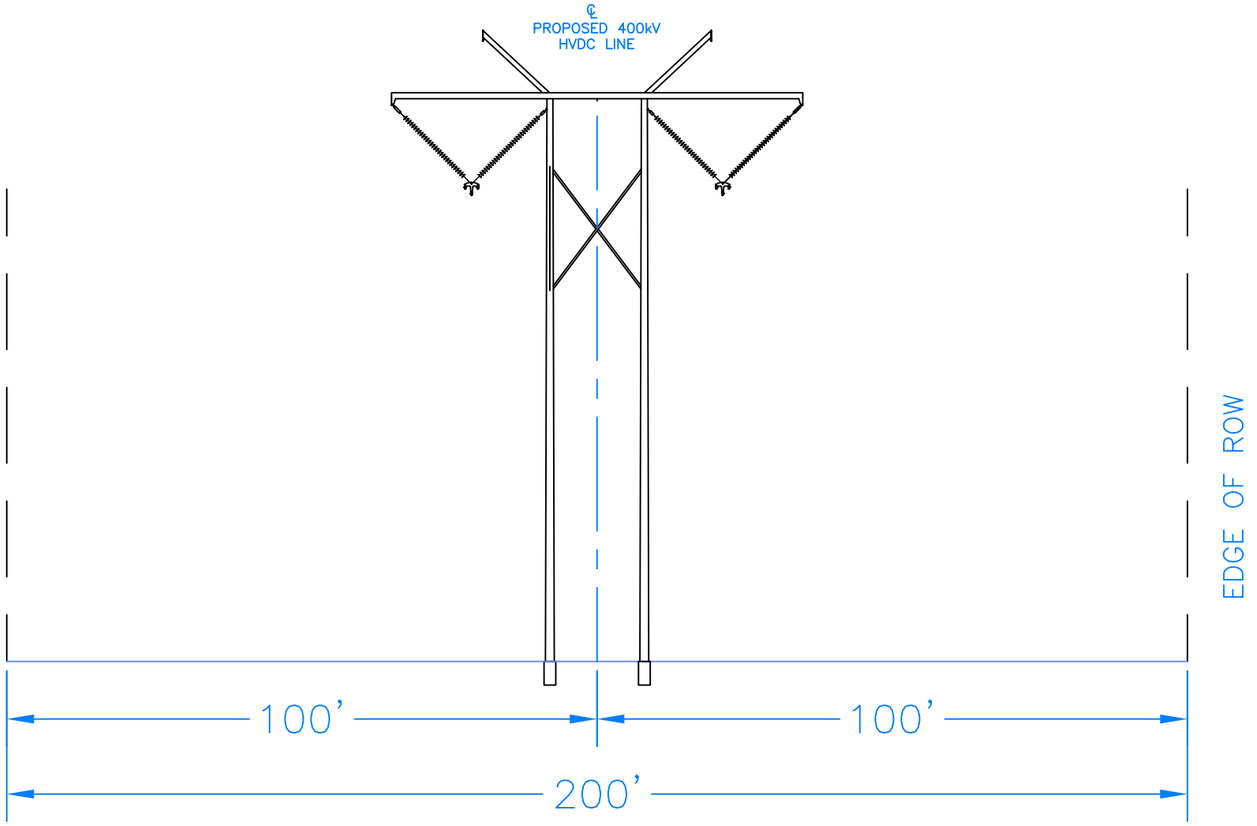
PREPARED BY	JTF
REVIEW BY	
APPROVED BY	
SCALE	NTS
SHEET	1 OF 1
INDEX	900007
	06/14/2017

FIGURE 2-5
CROSS-SECTION
GRANITE STATE POWER LINK
NEW OVERHEAD 400kV DC LINE
MILE 53.17 TO MILE 58.23

INCHES ON ORIGINAL

900007-C-X-14-P

900007-C-X-15-P



NEW HVDC ROW
200’ WIDE CORRIDOR – EASEMENT
MILE 58.23 TO NEW CONVERTER STATION
FACING COMERFORD
PROPOSED CONFIGURATION

NOTES:
1. ALL INFORMATION PRESENTED IS CONCEPTUAL AND SUBJECT TO CHANGE BASED ON ADVANCEMENT OF ENGINEERING.
2. STRUCTURE HEIGHTS DEPICTED ARE AN AVERAGE AND WILL VARY ON A SPAN BY SPAN BASIS.
3. NEW STEEL POLE STRUCTURES TO BE SELF-WEATHERING STEEL WITH BROWN PORCELAIN OR GLASS INSULATORS.

VER	DATE	VERSION DESCRIPTION	PREPARED	REVIEWED	APPROVED	VERSION
0	06/14/2017	PRELIMINARY – ISSUED FOR OUTREACH & INITIAL PERMITTING				1
1	12/19/2017	UPDATED PER PROJECT INPUT FROM TRANSENERGIE – ISSUED FOR PERMITTING				
2						
3						

GRANITE STATE POWER LINK

PREPARED BY	JTF	06/14/2017
REVIEW BY		
APPROVED BY		
SCALE	NTS	
SHEET	1 OF 1	
INDEX	900007	

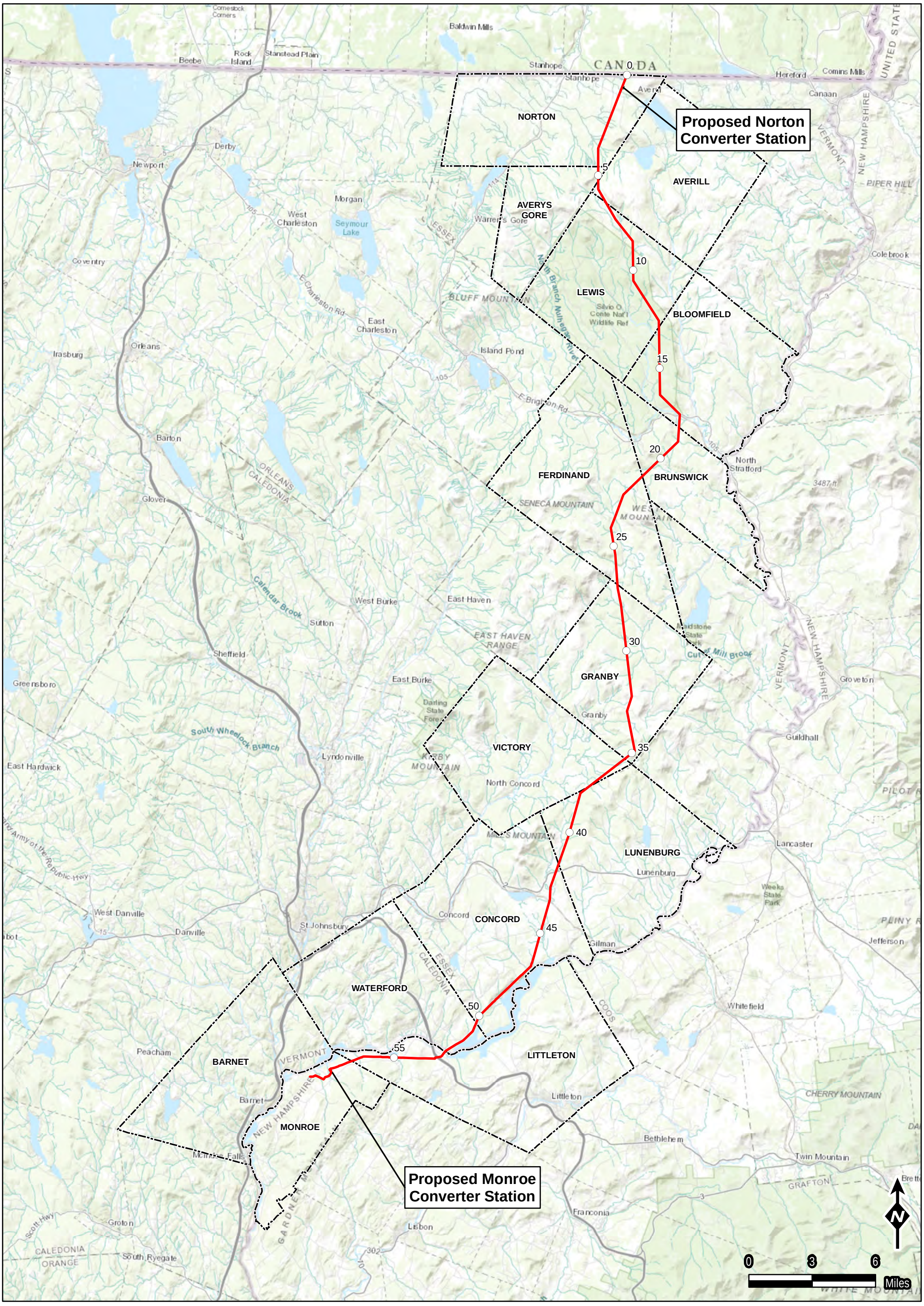
FIGURE 2-6
CROSS-SECTION
GRANITE STATE POWER LINK
NEW OVERHEAD 400kV DC LINE
MILE 58.23 TO NEW CONVERTER STATION

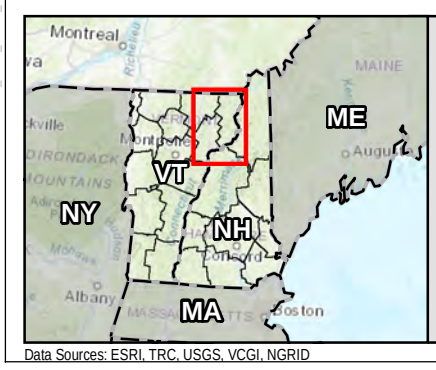
INCHES ON ORIGINAL

900007-C-X-15-P

EXHIBIT C

General Area Map





Milepost (5 mile)

Proposed GSPL Line

Project Towns

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

Exhibit C

General Area Map

Map Produced by TRC on 12/5/2017

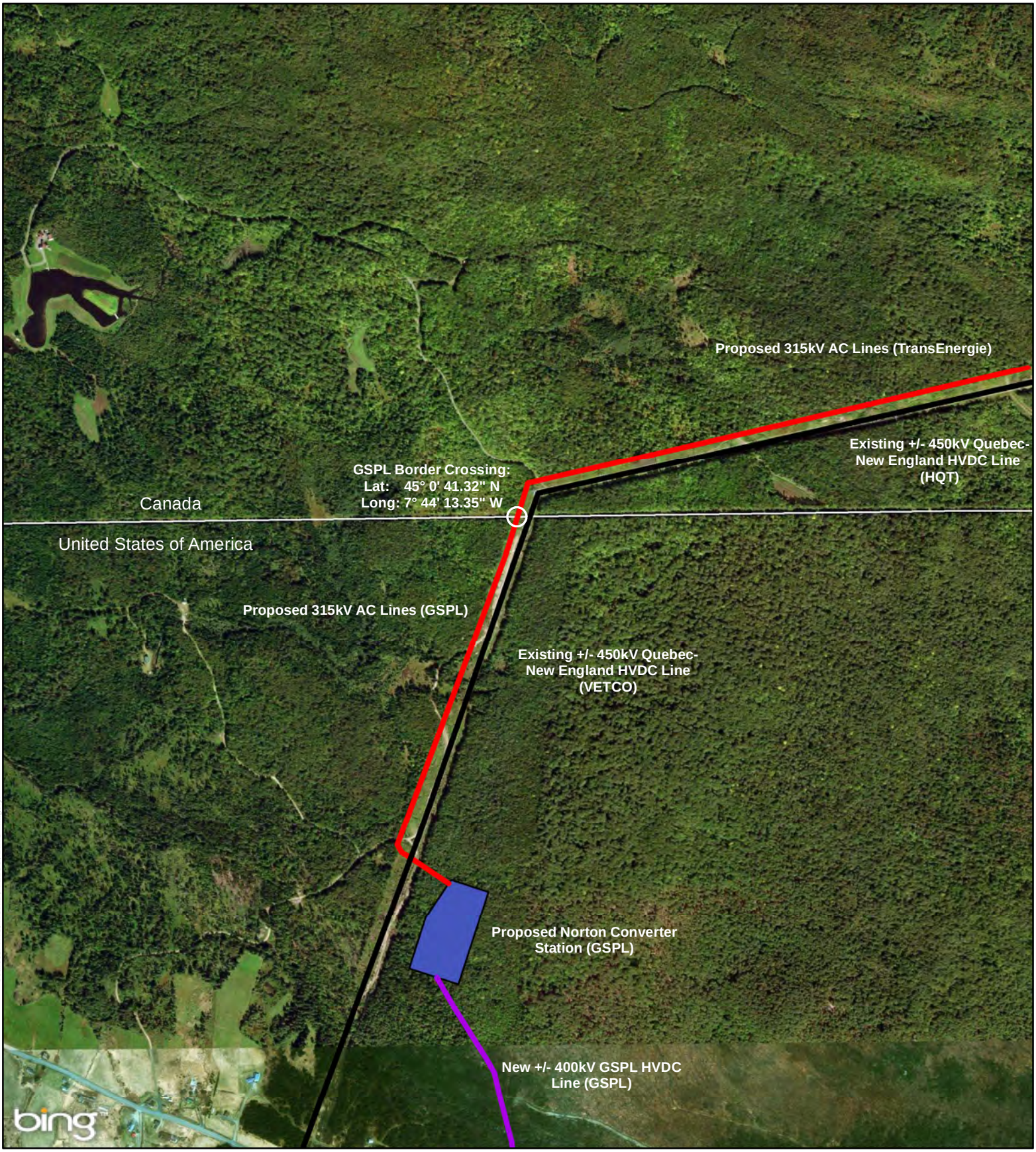
Data Sources: ESRI, TRC, USGS, VCGI, NGRID

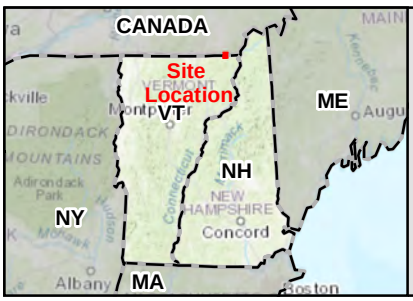
Path: V:\PROJECTS\AUGUSTA\NGRID\Granite_State_Power_Link\MXD\Presidential_Permit_Figures\Presidential_Permit_Overall.mxd

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

EXHIBIT D

Area Map of Border Crossing





Legend

- Existing 450kV Line
- Proposed 400kV GSPL HVDC Line
- Proposed 315kV AC Line
- Proposed Norton Converter Station

N

0 500 1,000

Feet

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

Area Map of Border Crossing

Map Produced by TRC on 12/19/2017

Path: J:\PROJECTS\AUS\USA\NGRID\Granite_State_Power_Link\GSPL_BorderCrossing_Area_v10_12Jan.mxd Sources: TRC, NGRID, VELCO, BING Imagery

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

EXHIBIT E

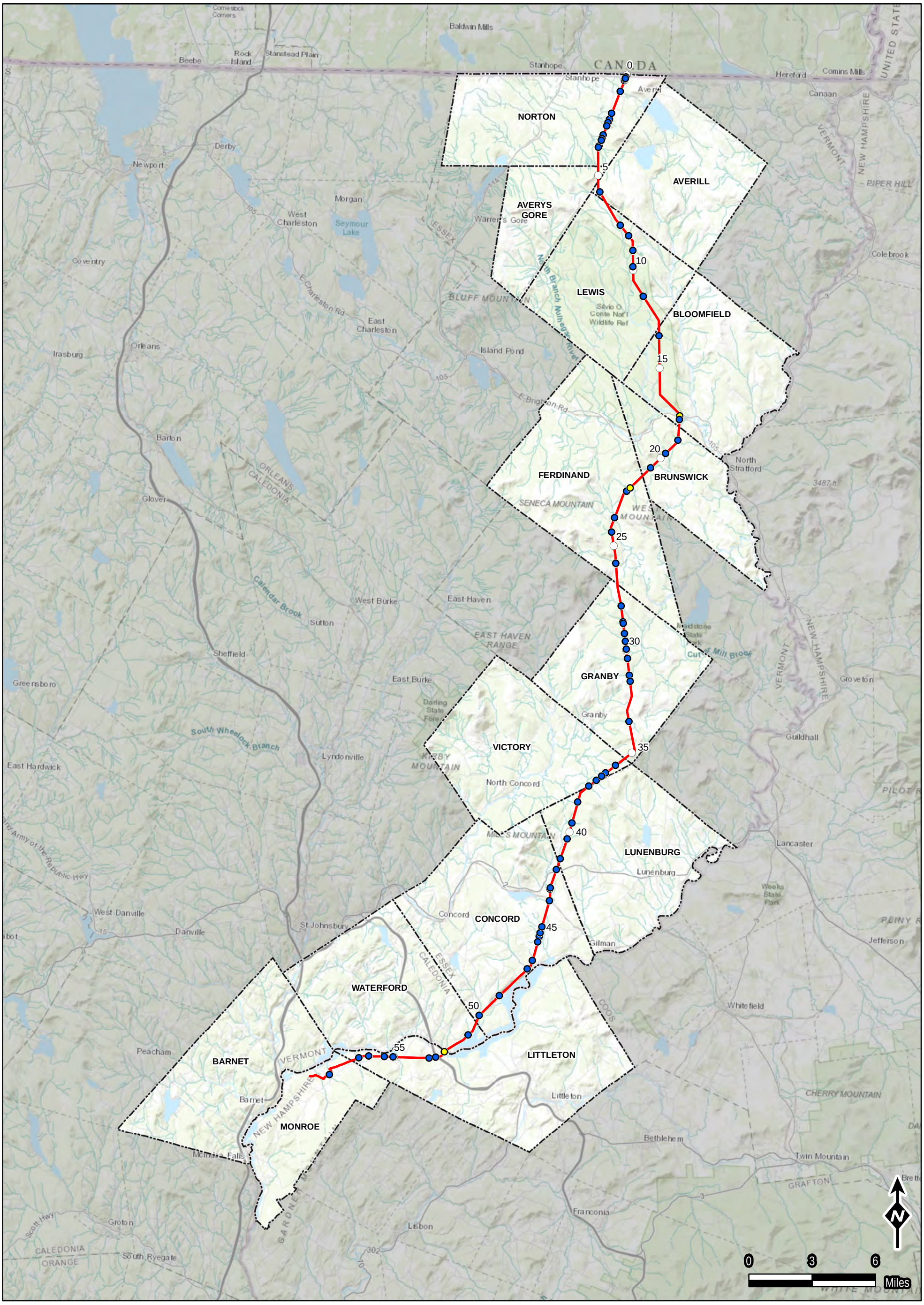
System Power Flow Plan

[To be submitted at a later date]

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

EXHIBIT F

Sections 3 and 4 Figures



Milepost (5 mile)

Proposed GSPL Line

Not Navigable Water

Navigable Water

Project Towns

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

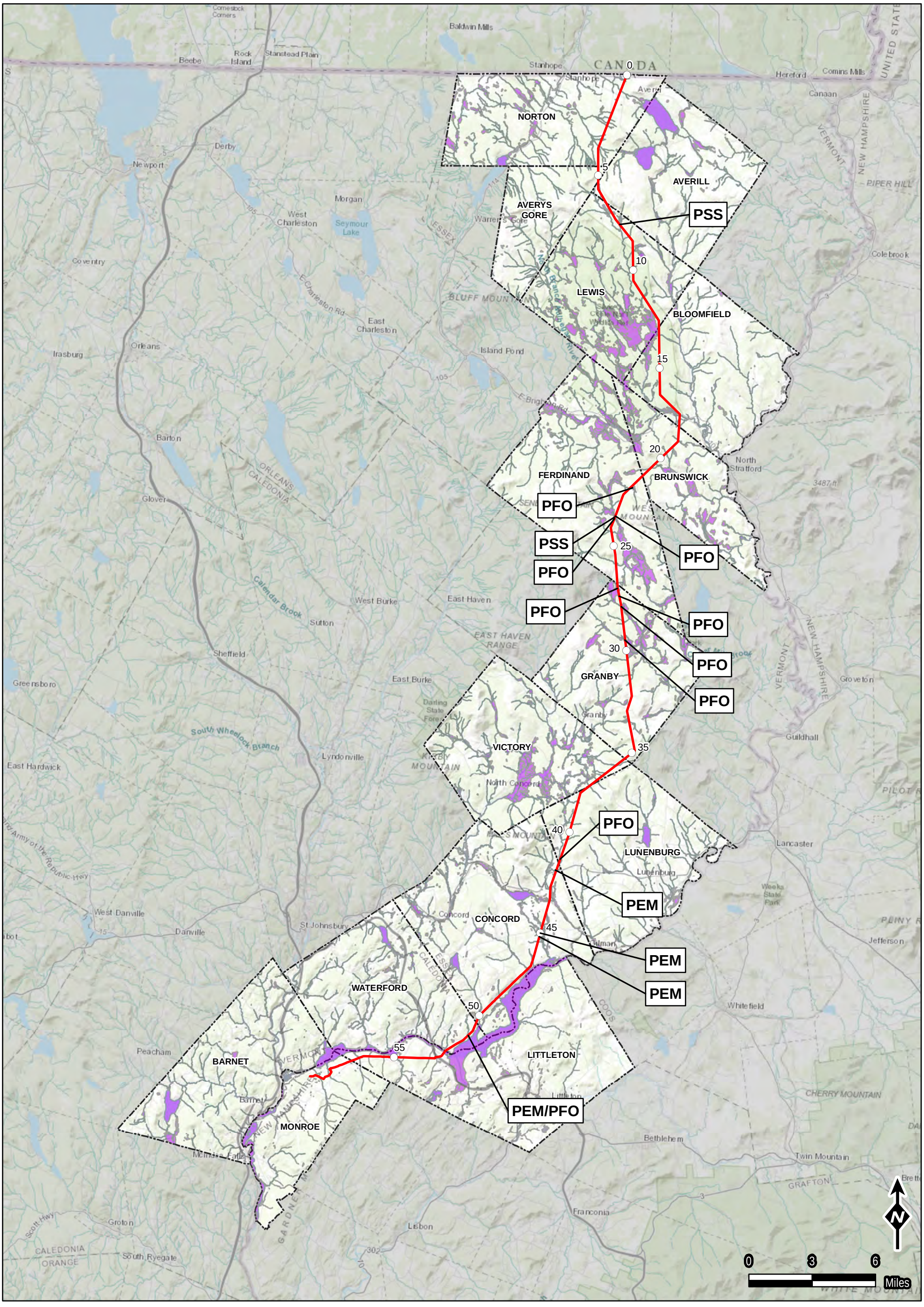
Figure 3.3-1

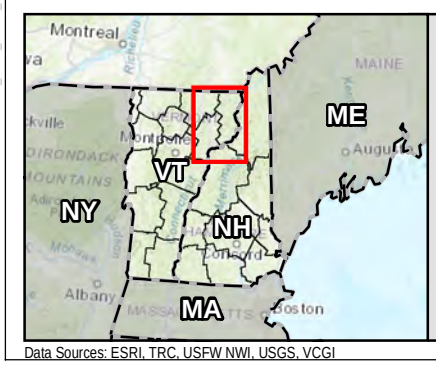
Waterbodies Crossed by the GSPL Line

Map Produced by TRC on 12/5/2017

Data Sources: ESRI, TRC, NHD, USGS, VCGI

Path: V:\PROJECTS\AUGUSTA\NGRID\Granite_State_Power_Link\MXD\Presidential_Permit_Figures\Presidential_Permit_WaterbodiesCrossed.mxd





Milepost (5 mile)
Proposed GSPL Line
Wetlands (NWI)
Project Towns

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

Figure 3.4-1

NWI Wetlands Crossed by the GSPL Line

Map Produced by TRC on 12/5/2017

Data Sources: ESRI, TRC, USFW NWI, USGS, VCGI

Path: V:\PROJECTS\AUGUSTAINGRID\Granite_State_Power_Link\MXD\Presidential_Permit_Figures\Presidential_Permit_WetlandsCrossed.mxd

Comestock Corners
Baldwin Mills
Beebe
Rock Island
Stanstead Plain
Stanhope
CANADA
Hereford
Comins Mills
NORTON
AVERILL
AVERYS GORE
LEWIS
BLOOMFIELD
FERDINAND
BRUNSWICK
GRANBY
VICTORY
LUNENBURG
CONCORD
WATERFORD
BARNET
LITTLETON
MONROE
0
5
10
15
20
25
30
35
40
45
50
55
N
0 3 6
Miles

Montreal
MAINE
ME
VT
NY
NH
MA
Albany
Boston

Milepost (5 mile)
Proposed GSPL Line
Open Water
Developed, Open Space
Developed, Low Intensity
Developed, Medium Intensity
Developed, High Intensity
Barren Land
Deciduous Forest
Evergreen Forest
Mixed Forest
Shrub/Scrub
Grassland/Her...
Pasture/Hay
Cultivated Crops
Woody Wetlands
Emergent Herbaceous Wetlands
Project Towns

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

Figure 3.5-1

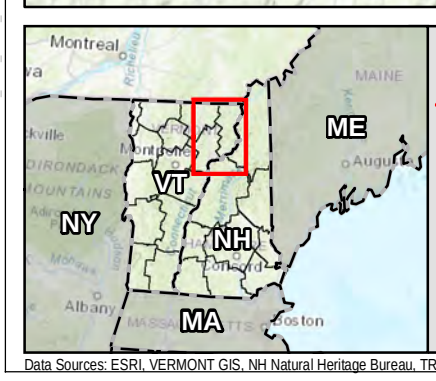
Vegetation in the GSPL Project Area

Map Produced by TRC on 12/6/2017

Data Sources: ESRI, USGS, TRC, NLCD 2011, VCGI

Path: V:\PROJECTS\AUGUSTA\NGRID\Granite_State_Power_Link\MXD\Presidential_Permit_Figures\Presidential_Permit_Vegetation.mxd

NH Exemplary Natural Communities*



- Milepost (5 mile)
- Proposed GSPL Line
- Calcareous Riverside Seep & Sloping Fen System
- Dry Red Oak-White Pine Forest
- Lowland Spruce-Fir Forest
- Northern Hardwood Forest
- Northern White Cedar Swamp
- Red Spruce-Northern Hardwood Forest
- Project Towns

*NH Exemplary Communities in the area of the transmission line include: Calcareous riverside seep and Calcareous sloping fen system.

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

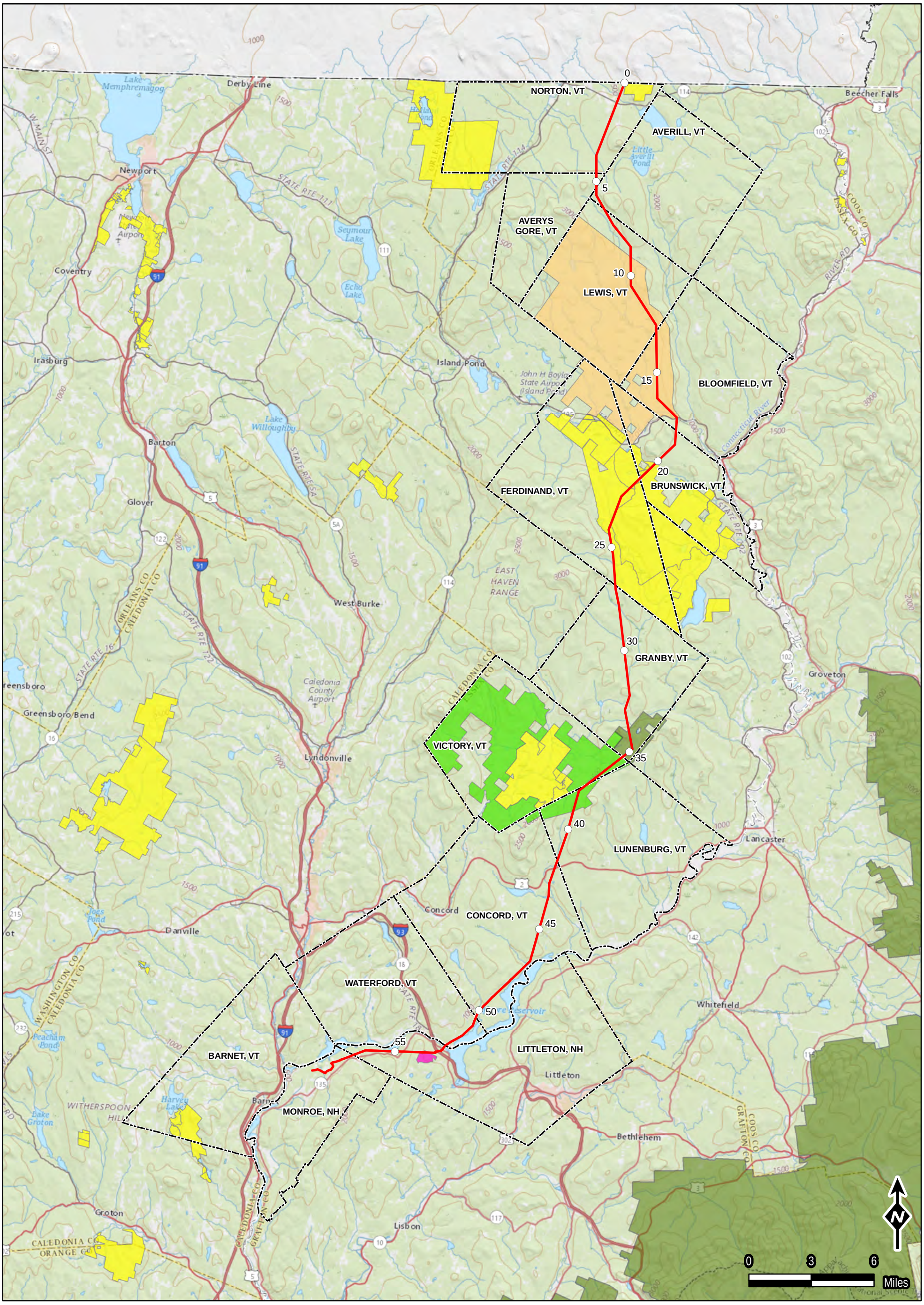
Figure 3.7-1

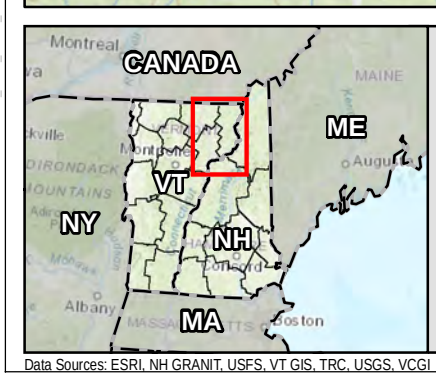
Vermont Natural Communities and New Hampshire Exemplary Communities

Map Produced by TRC on 12/12/2017

Data Sources: ESRI, VERMONT GIS, NH Natural Heritage Bureau, TRC, USGS, VCGI

Path: V:\PROJECTS\AUGUSTA\NGRID\Granite_State_Power_Link\MXD\Presidential_Permit_Figures\Presidential_Permit_CriticalHabitat.mxd





- Milepost (5 mile)
- Proposed GSPL Line
- Natonal Wildlife Refuge
- State Forest
- State-Owned Land With No Use Designation
- USFS National Forest Land
- Wildlife Management Area
- Project Towns

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

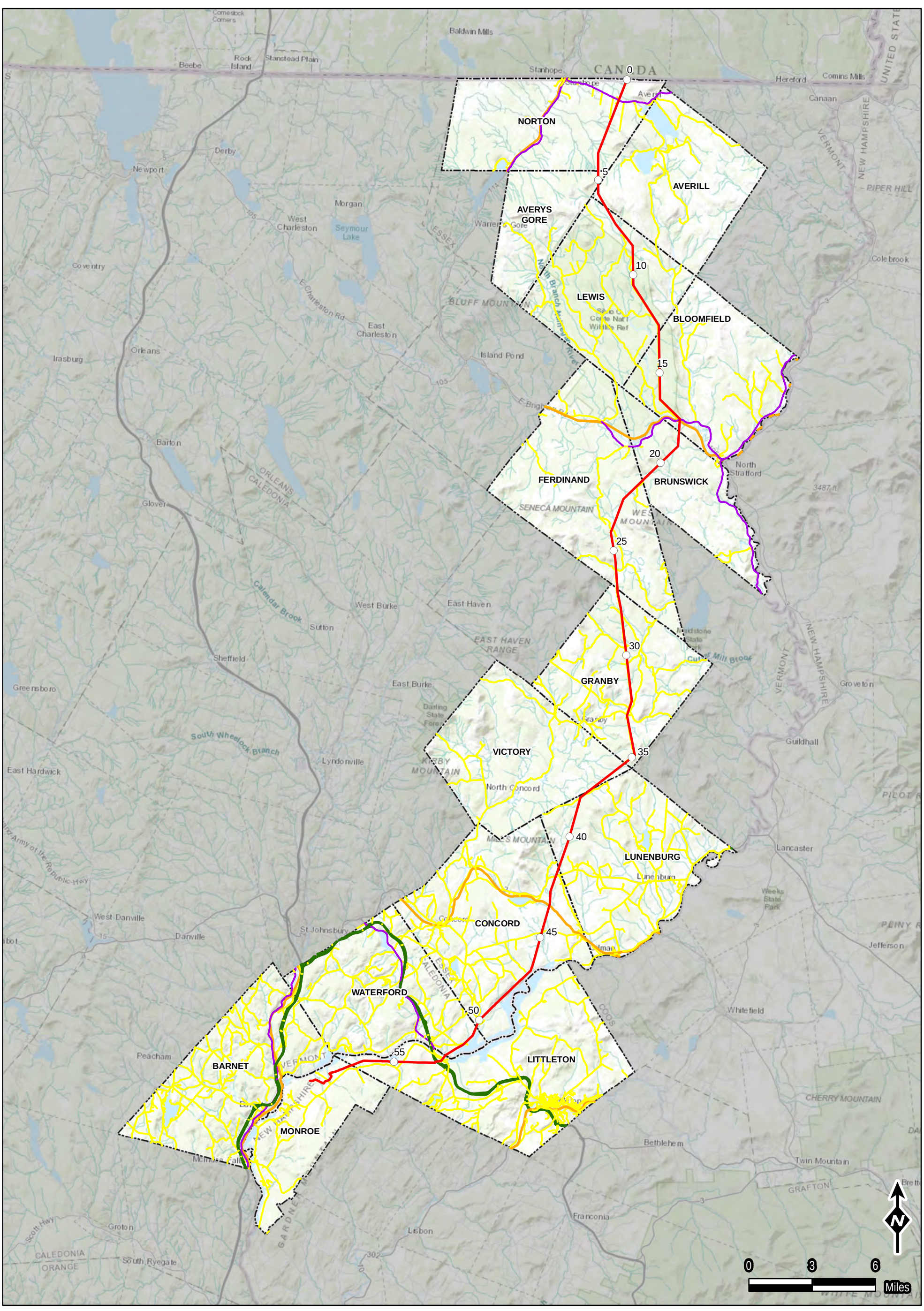
Figure 3.8-1

Public Lands Crossed by the GSPL Line

Map Produced by TRC on 12/19/2017

Data Sources: ESRI, NH GRANIT, USFS, VT GIS, TRC, USGS, VCGI

Path: V:\PROJECTS\AUGUSTA\NGRID\Granite_State_Power_Link\MXD\Presidential_Permit_Figures\Presidential_Permit_ConservationLands.mxd



- Milepost (5 mile)
- Project Towns
- Proposed GSPL Line
- Railroad
- Interstate Highway
- State Highway
- County Road

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

Figure 3.8-2

Roads and Railroads Crossed by the GSPL Line

Map Produced by TRC on 12/5/2017

Data Sources: ESRI, NH GRANIT, TRC, VERMONT GIS, USGS, VCGI

Path: V:\PROJECTS\AUGUSTAINGRID\Granite_State_Power_Link\MXD\Presidential_Permit_Figures\Presidential_Permit_Roads_and_RR_Crossing.mxd

Existing Conditions

Simulated Conditions

Bloomfield, Essex County
Powerline Access #3 - Looking North

Viewpoint Location

PHOTOGRAPH INFORMATION

Date of photograph: 6/5/2017
Time of photograph: 1:10 PM
Weather Condition: Cloudy
Viewing Direction: North
Latitude: 44°47'35.58"N
Longitude: 71°41'38.97"W
Photo Location: View looking north along Powerline Access #3, north of VT-105, in the town of Bloomfield in Essex County, VT.

FIGURE 3.11-1
VISUAL SIMULATION
Silvio O. Conte NFWR

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

Existing Conditions

Simulated Conditions

Ferdinand, Essex County
S. America Pond Rd. - Looking North

Viewpoint Location

PHOTOGRAPH INFORMATION

Date of photograph: 6/5/2017
Time of photograph: 2:20 PM
Weather Condition: Cloudy
Viewing Direction: North
Latitude: 44°42'18.42"N
Longitude: 71°44'7.19"W
Photo Location: View looking north along ROW corridor, north of S. America Pond Rd., in the town of Ferdinand in Essex County, VT.

FIGURE 3.11-2
VISUAL SIMULATION
West Mountain WMA

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

Victory, Essex County
Pond Hill Rd. - Looking Northeast

Viewpoint Location

PHOTOGRAPH INFORMATION

Date of photograph:	6/5/2017
Time of photograph:	4:53 PM
Weather Condition:	Cloudy
Viewing Direction:	Northeast
Latitude:	44°31'21.36"N
Longitude:	71°45'4.68"W

Photo Location: View looking northeast along ROW corridor, north of Pond Hill Rd., in the town of Victory in Essex County, VT.

Existing Conditions

Simulated Conditions

FIGURE 3.11-3
VISUAL SIMULATION
Victory State Forest

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

Canada

Norton Converter Station Alternative 2

Norton Converter Station Alternative 1

Proposed Norton Converter Station

NORTON, VT

R5UBH

PEM1C

PUBH

PUBHx

R3UBH

Averill Creek

STATE RTE 114

MOUNTAIN VIEW LN

BOUDETTE RD

SUNDER HILL RD

Averill Cr

0 250 500 Feet

N

- VELCO Structures
- VELCO Existing Line
- Proposed Project ROW
- Existing VELCO ROW
- Proposed Norton Converter Station
- Alternative Stations
- Project Towns
- Stream and Rivers (NHD)
- VSWI Wetland
- Wetlands (NWI)
- Wildlife Management Area

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

Figure 4.1-1
Norton Converter Station Alternative Sites
Norton, VT

Map Produced by TRC on 12/5/2017

Data Sources: ESRI, FEMA, NH GRANIT, NCED, NHD, NWI, TRC, USGS, VCGI

Path: V:\PROJECTS\AUGUSTA\NGRID\Granite_State_Power_Link\MXD\Alternative_Station_Figures\Alternative_& Proposed_Stations_11x17P_20171130.mxd

BARNET, VT

LITTLETON, NH

Connecticut River

Monroe Converter Station Alternative 2

PEM1Eh

Monroe Converter Station Alternative 1

MONROE, NH

PUBHh

Proposed Monroe Converter Station

R5UBH

HILL TOP RD

DAM RD

Scarrit Brook

0 250 500 Feet

N

- Proposed Project ROW
- Existing NEPCO ROW
- Proposed Monroe Converter Station
- Alternative Stations
- Project Towns
- Stream and Rivers (NHD)
- NH Floodplain Zone (FEMA)
- Wetlands (NWI)
- National Conservation Easements (NCED)

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

Figure 4.1-2
Monroe Converter Station
Alternative Sites
Monroe, NH

Map Produced by TRC on 12/5/2017

Data Sources: ESRI, FEMA, NH GRANIT, NCED, NHD, NWI, TRC, USGS, VCGI

Path: V:\PROJECTS\AUG\USTAINGRID\Granite_State_Power_Link\MXD\Alternative_Station_Figures\Alternative_& Proposed_Stations_11x17P_20171130.mxd

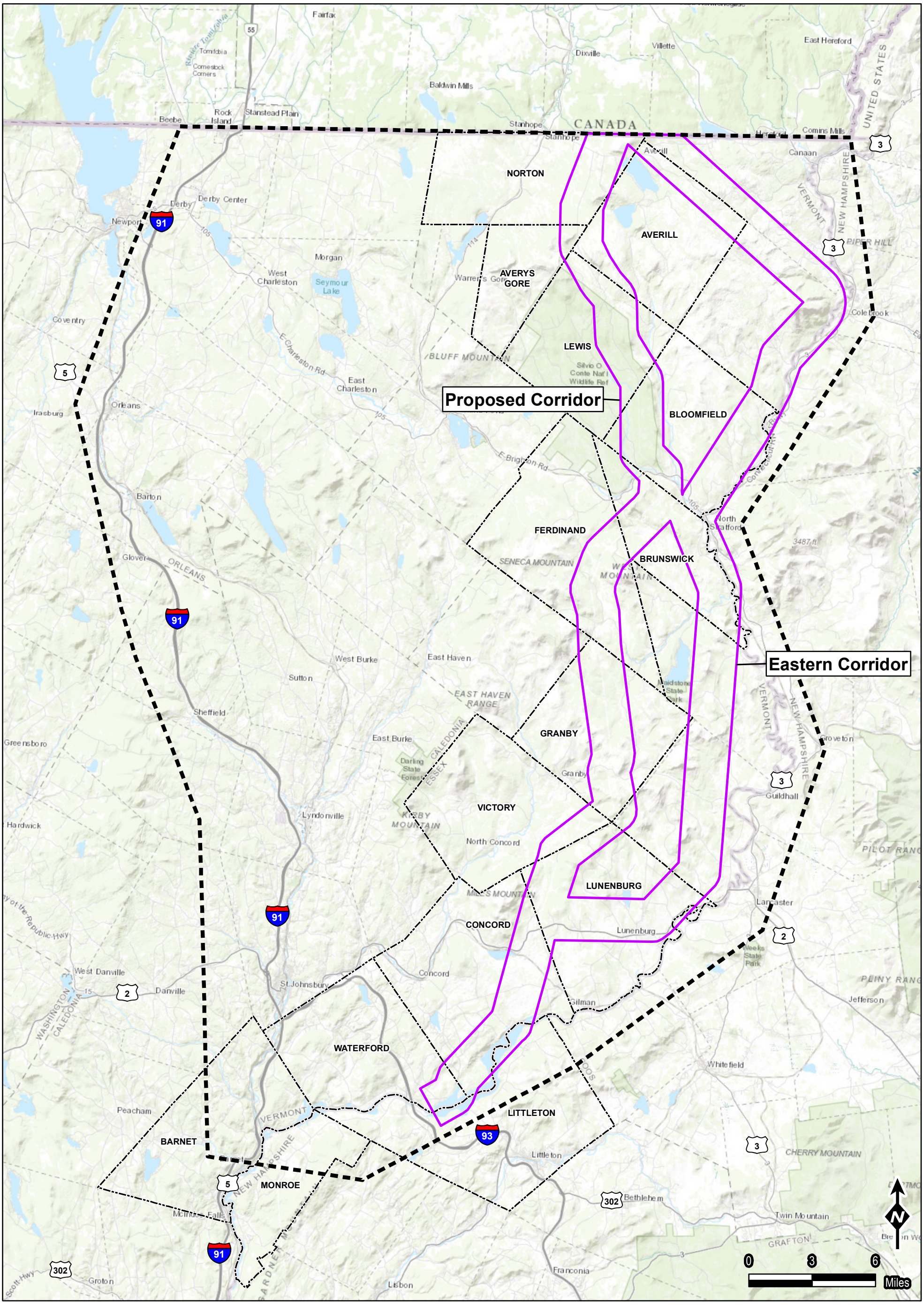

Proposed Corridor
Eastern Corridor
NORTON
AVERILL
AVERYS GORE
LEWIS
BLOOMFIELD
FERDINAND
BRUNSWICK
GRANBY
VICTORY
LUNENBURG
CONCORD
WATERFORD
BARNET
MONROE
LITTLETON
CANADA
UNITED STATES
Fairfax
Tomifobia
Comestock Corners
Dixville
Villette
East Hereford
Baldwin Mills
Beebe
Rock Island
Stanstead Plain
Stanhope
Averill
Canaan
Comins Mills
Derby
Derby Center
Newport
Morgan
West Charleston
Seymour Lake
Warren's Gore
Coventry
Colebrook
Irasburg
Orleans
East Charleston
E Charleston Rd
BLUFF MOUNTAIN
Silvio O Conte Nat'l Wildlife Ref
E Brighton Rd
Barton
Glover
ORLEANS
West Burke
East Haven
Sutton
EAST HAVEN RANGE
Sheffield
East Burke
Darling State Forest
CALEDONIA
ESSEX
KIRBY MOUNTAIN
Granby
Guildhall
Greensboro
Hardwick
Lyndonville
North Concord
MILES MOUNTAIN
Lancaster
Lunenburg
Meeks State Park
West Danville
Danville
St Johnsbury
Concord
Gilman
Jefferson
Whitefield
Peacham
Littleton
Bethlehem
Twin Mountain
CHERRY MOUNTAIN
GRAFTON
Franconia
Lisbon
Groton
McIndoe Falls
Scott Hwy
Path of the Republic Hwy
WASHINGTON
CALEDONIA
VERMONT
NEW HAMPSHIRE
PILOT RANGE
PLINY RANGE
SENECA MOUNTAIN
WILDCAT MOUNTAIN
Maidstone State Park
North Stratford
3487 ft
0 3 6
Miles
N
Montreal
MAINE
ME
VT
NY
NH
MA
Albany
Boston
Alternative Route Corridors
Study Area
Project Towns
GRANITE STATE POWER LINK
A Ready Path to Clean Energy
Figure 4.1-3
GSPL Siting Region and Alternative Corridors
Map Produced by TRC on 12/20/2017
Data Sources: ESRI, TRC, USFW NWI, USGS, VCGI
Path: V:\PROJECTS\AUGUSTAINGRID\Granite_State_Power_Link\MXD\Presidential_Permit_Figures\Presidential_Permit_SitingRegion_AltCorrs.mxd

EXHIBIT G

Existing Resource Information – Raw Data Tables

- Soils Crossed by the GSPL Centerline
- Waterbody Crossings
- NWI Wetlands Crossed in Vermont by the GSPL Centerline
- NWI Wetlands Crossed in New Hampshire by the GSPL Centerline
- Land Use and Vegetation Crossed by the GSPL Centerline
- Conserved Lands Crossed by the GSPL Centerline
- Roads and Railroads Crossed by the GSPL Centerline

Soil Crossed by the GSPL Centerline										
State	**Town**	**Crossing Length (ft)**	**Map Unit Symbol (MUSYM)**	**Soil Name (muname)**	**Percent Slopes (slopegradd)**	**Prime Farmland (farmlndcl)**	**Hydric Soil Rating (Yes or No for Hydric – hydricrati)**	**Hydric Soil Group (hydgrpdcd)**	**Parent Material (pmgroupnam)**	Depth to Bedrock (brockdepmi)
VT	AVERILL	107	SIE12	Cabot-Colonel complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	AVERILL	780	SIE32	Colonel-Peru complex, 8 to 15 percent slopes, very stony	11	Not prime farmland	No	D	loamy basal till	N/A
VT	AVERILL	2959	SIE33	Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy basal till	N/A
VT	AVERILL	712	SIE42	Tunbridge-Colonel-Cabot complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	No	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from granite and/or loamy lodgment till derived from phyllite	71
VT	AVERILL	222	SIE53	Tunbridge-Lyman complex, 15 to 35 percent slopes, very rocky	25	Not prime farmland	No	C	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	AVERILL	1140	SIE21	Wilmington-Colonel complex, 0 to 8 percent slopes, very stony	4	Not prime farmland	Yes	D	loamy basal till	N/A
VT	AVERYS GORE	1425	SIE12	Cabot-Colonel complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	AVERYS GORE	189	SIE32	Colonel-Peru complex, 8 to 15 percent slopes, very stony	11	Not prime farmland	No	D	loamy basal till	N/A
VT	AVERYS GORE	1114	SIE33	Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy basal till	N/A
VT	AVERYS GORE	82	SIE42	Tunbridge-Colonel-Cabot complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	No	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from granite and/or loamy lodgment till derived from phyllite	71
VT	AVERYS GORE	819	SIE21	Wilmington-Colonel complex, 0 to 8 percent slopes, very stony	4	Not prime farmland	Yes	D	loamy basal till	N/A
VT	BLOOMFIELD	2865	SIE11	Cabot silt loam, 0 to 8 percent slopes, very stony	5	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	BLOOMFIELD	11293	SIE12	Cabot-Colonel complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	BLOOMFIELD	899	SIE63	Monadnock-Sunapee complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	B	sandy and gravelly ablation till	N/A
VT	BLOOMFIELD	1954	SIE62	Monadnock-Sunapee-Colonel complex, 8 to 15 percent slopes, very stony	11	Not prime farmland	No	B	sandy and gravelly ablation till	N/A
VT	BLOOMFIELD	104	SIE60	Moosilauke very fine sandy loam, 0 to 8 percent slopes, very stony	4	Not prime farmland	Yes	A/D	sandy and gravelly ablation till	N/A
VT	BLOOMFIELD	4557	SIE33	Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy basal till	N/A
VT	BLOOMFIELD	311	SIE61	Sunapee-Moosilauke complex, 0 to 8 percent slopes, very stony	5	Not prime farmland	No	B/D	sandy and gravelly ablation till	N/A
VT	BLOOMFIELD	1812	SIE42	Tunbridge-Colonel-Cabot complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	No	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from granite and/or loamy lodgment till derived from phyllite	71
VT	BLOOMFIELD	951	SIE54	Tunbridge-Lyman complex, 35 to 60 percent slopes, very rocky	50	Not prime farmland	No	C	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	BLOOMFIELD	633	SIE43	Tunbridge-Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy till	64
VT	BLOOMFIELD	1663	SIE41	Tunbridge-Peru-Wilmington complex, 0 to 8 percent slopes, very stony	4	Not prime farmland	No	D	loamy till	64
VT	BLOOMFIELD	65	W	Water	0	Not prime farmland	Unranked	N/A	N/A	N/A

Soil Crossed by the GSPL Centerline										
State	**Town**	**Crossing Length (ft)**	**Map Unit Symbol (MUSYM)**	**Soil Name (muname)**	**Percent Slopes (slopegradd)**	**Prime Farmland (farmlndcl)**	**Hydric Soil Rating (Yes or No for Hydric – hydricrati)**	**Hydric Soil Group (hydgrpdcd)**	**Parent Material (pmgroupnam)**	Depth to Bedrock (brockdepmi)
VT	BRUNSWICK	1916	SIE11	Cabot silt loam, 0 to 8 percent slopes, very stony	5	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	BRUNSWICK	3405	SIE12	Cabot-Colonel complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	BRUNSWICK	924	SIE33	Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy basal till	N/A
VT	BRUNSWICK	5163	SIE42	Tunbridge-Colonel-Cabot complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	No	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from granite and/or loamy lodgment till derived from phyllite	71
VT	BRUNSWICK	1452	SIE53	Tunbridge-Lyman complex, 15 to 35 percent slopes, very rocky	25	Not prime farmland	No	C	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	BRUNSWICK	324	SIE52	Tunbridge-Lyman complex, 8 to 15 percent slopes, very rocky	12	Not prime farmland	No	D	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	BRUNSWICK	842	SIE43	Tunbridge-Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy till	64
VT	BRUNSWICK	270	SIE41	Tunbridge-Peru-Wilmington complex, 0 to 8 percent slopes, very stony	4	Not prime farmland	No	D	loamy till	64
VT	BRUNSWICK	1682	SIE21	Wilmington-Colonel complex, 0 to 8 percent slopes, very stony	4	Not prime farmland	Yes	D	loamy basal till	N/A
VT	CONCORD	3961	SIE11	Cabot silt loam, 0 to 8 percent slopes, very stony	5	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	CONCORD	2894	SIE12	Cabot-Colonel complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	CONCORD	988	SIE64	Monadnock fine sandy loam, 35 to 60 percent slopes, very stony	48	Not prime farmland	No	B	sandy and gravelly ablation till	N/A
VT	CONCORD	7170	SIE63	Monadnock-Sunapee complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	B	sandy and gravelly ablation till	N/A
VT	CONCORD	9193	SIE62	Monadnock-Sunapee-Colonel complex, 8 to 15 percent slopes, very stony	11	Not prime farmland	No	B	sandy and gravelly ablation till	N/A
VT	CONCORD	257	SIE60	Moosilauke very fine sandy loam, 0 to 8 percent slopes, very stony	4	Not prime farmland	Yes	A/D	sandy and gravelly ablation till	N/A
VT	CONCORD	1713	SIE33	Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy basal till	N/A
VT	CONCORD	3829	SIE61	Sunapee-Moosilauke complex, 0 to 8 percent slopes, very stony	5	Not prime farmland	No	B/D	sandy and gravelly ablation till	N/A
VT	CONCORD	520	SIE42	Tunbridge-Colonel-Cabot complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	No	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from granite and/or loamy lodgment till derived from phyllite	71
VT	CONCORD	1161	SIE53	Tunbridge-Lyman complex, 15 to 35 percent slopes, very rocky	25	Not prime farmland	No	C	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	CONCORD	3420	SIE54	Tunbridge-Lyman complex, 35 to 60 percent slopes, very rocky	50	Not prime farmland	No	C	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	CONCORD	1149	SIE52	Tunbridge-Lyman complex, 8 to 15 percent slopes, very rocky	12	Not prime farmland	No	D	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	CONCORD	1434	SIE43	Tunbridge-Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy till	64

Soil Crossed by the GSPL Centerline										
State	**Town**	**Crossing Length (ft)**	**Map Unit Symbol (MUSYM)**	**Soil Name (muname)**	**Percent Slopes (slopegradd)**	**Prime Farmland (farmlndcl)**	**Hydric Soil Rating (Yes or No for Hydric – hydricrati)**	**Hydric Soil Group (hydgrpdcd)**	**Parent Material (pmgroupnam)**	Depth to Bedrock (brockdepmi)
VT	CONCORD	1493	SIE41	Tunbridge-Peru-Wilmington complex, 0 to 8 percent slopes, very stony	4	Not prime farmland	No	D	loamy till	64
VT	CONCORD	1609	56D	Vershire-Glover complex, 15 to 35 percent slopes, very rocky	25	Not prime farmland	No	C	loamy till	46
VT	CONCORD	22	56D	Vershire-Glover complex, 15 to 35 percent slopes, very rocky	25	Not prime farmland	No	C	loamy till	46
VT	CONCORD	153	214C	Vershire-Lombard complex, 8 to 15 percent slopes, very stony	11	Not prime farmland	No	C	loamy till	56
VT	CONCORD	304	W	Water	0	Not prime farmland	Unranked	N/A	N/A	N/A
VT	CONCORD	4825	SIE21	Wilmington-Colonel complex, 0 to 8 percent slopes, very stony	4	Not prime farmland	Yes	D	loamy basal till	N/A
VT	CONCORD	271	SIE8	Wonsqueak, Pondicherry, and Bucksport mucks, 0 to 2 percent slopes	1	Not prime farmland	Yes	A/D	organic material over loamy till	N/A
VT	FERDINAND	5226	SIE11	Cabot silt loam, 0 to 8 percent slopes, very stony	5	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	FERDINAND	8136	SIE12	Cabot-Colonel complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	FERDINAND	473	32D	Colton-Duxbury complex, 15 to 25 percent slopes	20	Not prime farmland	No	A	sandy and gravelly glaciofluvial deposits	N/A
VT	FERDINAND	426	32E	Colton-Duxbury complex, 25 to 60 percent slopes	43	Not prime farmland	No	A	sandy and gravelly glaciofluvial deposits	N/A
VT	FERDINAND	217	SIE64	Monadnock fine sandy loam, 35 to 60 percent slopes, very stony	48	Not prime farmland	No	B	sandy and gravelly ablation till	N/A
VT	FERDINAND	194	SIE63	Monadnock-Sunapee complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	B	sandy and gravelly ablation till	N/A
VT	FERDINAND	552	SIE62	Monadnock-Sunapee-Colonel complex, 8 to 15 percent slopes, very stony	11	Not prime farmland	No	B	sandy and gravelly ablation till	N/A
VT	FERDINAND	2886	SIE33	Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy basal till	N/A
VT	FERDINAND	248	SIE61	Sunapee-Moosilauke complex, 0 to 8 percent slopes, very stony	5	Not prime farmland	No	B/D	sandy and gravelly ablation till	N/A
VT	FERDINAND	2461	SIE42	Tunbridge-Colonel-Cabot complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	No	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from granite and/or loamy lodgment till derived from phyllite	71
VT	FERDINAND	1261	SIE53	Tunbridge-Lyman complex, 15 to 35 percent slopes, very rocky	25	Not prime farmland	No	C	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	FERDINAND	1689	SIE52	Tunbridge-Lyman complex, 8 to 15 percent slopes, very rocky	12	Not prime farmland	No	D	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	FERDINAND	3001	SIE43	Tunbridge-Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy till	64
VT	FERDINAND	2177	SIE21	Wilmington-Colonel complex, 0 to 8 percent slopes, very stony	4	Not prime farmland	Yes	D	loamy basal till	N/A
VT	FERDINAND	749	SIE8	Wonsqueak, Pondicherry, and Bucksport mucks, 0 to 2 percent slopes	1	Not prime farmland	Yes	A/D	organic material over loamy till	N/A
VT	GRANBY	2742	SIE11	Cabot silt loam, 0 to 8 percent slopes, very stony	5	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	GRANBY	18870	SIE12	Cabot-Colonel complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	GRANBY	575	SIE63	Monadnock-Sunapee complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	B	sandy and gravelly ablation till	N/A

Soil Crossed by the GSPL Centerline										
State	**Town**	**Crossing Length (ft)**	**Map Unit Symbol (MUSYM)**	**Soil Name (muname)**	**Percent Slopes (slopegradd)**	**Prime Farmland (farmlndcl)**	**Hydric Soil Rating (Yes or No for Hydric – hydricrati)**	**Hydric Soil Group (hydgrpdcd)**	**Parent Material (pmgroupnam)**	Depth to Bedrock (brockdepmi)
VT	GRANBY	460	SIE62	Monadnock-Sunapee-Colonel complex, 8 to 15 percent slopes, very stony	11	Not prime farmland	No	B	sandy and gravelly ablation till	N/A
VT	GRANBY	6641	SIE33	Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy basal till	N/A
VT	GRANBY	4369	SIE42	Tunbridge-Colonel-Cabot complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	No	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from granite and/or loamy lodgment till derived from phyllite	71
VT	GRANBY	2895	SIE53	Tunbridge-Lyman complex, 15 to 35 percent slopes, very rocky	25	Not prime farmland	No	C	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	GRANBY	2756	SIE52	Tunbridge-Lyman complex, 8 to 15 percent slopes, very rocky	12	Not prime farmland	No	D	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	GRANBY	1380	SIE43	Tunbridge-Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy till	64
VT	GRANBY	2636	SIE41	Tunbridge-Peru-Wilmington complex, 0 to 8 percent slopes, very stony	4	Not prime farmland	No	D	loamy till	64
VT	GRANBY	1998	SIE21	Wilmington-Colonel complex, 0 to 8 percent slopes, very stony	4	Not prime farmland	Yes	D	loamy basal till	N/A
VT	LEWIS	4139	SIE11	Cabot silt loam, 0 to 8 percent slopes, very stony	5	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	LEWIS	9944	SIE12	Cabot-Colonel complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	LEWIS	260	SIE32	Colonel-Peru complex, 8 to 15 percent slopes, very stony	11	Not prime farmland	No	D	loamy basal till	N/A
VT	LEWIS	13455	SIE33	Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy basal till	N/A
VT	LEWIS	1474	SIE42	Tunbridge-Colonel-Cabot complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	No	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from granite and/or loamy lodgment till derived from phyllite	71
VT	LEWIS	1	SIE54	Tunbridge-Lyman complex, 35 to 60 percent slopes, very rocky	50	Not prime farmland	No	C	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	LEWIS	292	SIE44	Tunbridge-Peru complex, 35 to 60 percent slopes, very stony	48	Not prime farmland	No	C	loamy till	64
VT	LEWIS	1310	SIE43	Tunbridge-Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy till	64
VT	LEWIS	2357	SIE41	Tunbridge-Peru-Wilmington complex, 0 to 8 percent slopes, very stony	4	Not prime farmland	No	D	loamy till	64
VT	LEWIS	1876	SIE21	Wilmington-Colonel complex, 0 to 8 percent slopes, very stony	4	Not prime farmland	Yes	D	loamy basal till	N/A
VT	LUNENBURG	1884	SIE11	Cabot silt loam, 0 to 8 percent slopes, very stony	5	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	LUNENBURG	7878	SIE12	Cabot-Colonel complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	LUNENBURG	370	SIE63	Monadnock-Sunapee complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	B	sandy and gravelly ablation till	N/A
VT	LUNENBURG	312	SIE62	Monadnock-Sunapee-Colonel complex, 8 to 15 percent slopes, very stony	11	Not prime farmland	No	B	sandy and gravelly ablation till	N/A
VT	LUNENBURG	307	SIE60	Moosilauke very fine sandy loam, 0 to 8 percent slopes, very stony	4	Not prime farmland	Yes	A/D	sandy and gravelly ablation till	N/A

Soil Crossed by the GSPL Centerline										
State	**Town**	**Crossing Length (ft)**	**Map Unit Symbol (MUSYM)**	**Soil Name (muname)**	**Percent Slopes (slopegradd)**	**Prime Farmland (farmlndcl)**	**Hydric Soil Rating (Yes or No for Hydric – hydricrati)**	**Hydric Soil Group (hydgrpdcd)**	**Parent Material (pmgroupnam)**	Depth to Bedrock (brockdepmi)
VT	LUNENBURG	8306	SIE33	Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy basal till	N/A
VT	LUNENBURG	778	SIE61	Sunapee-Moosilauke complex, 0 to 8 percent slopes, very stony	5	Not prime farmland	No	B/D	sandy and gravelly ablation till	N/A
VT	LUNENBURG	1138	SIE43	Tunbridge-Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy till	64
VT	NORTON	5902	SIE11	Cabot silt loam, 0 to 8 percent slopes, very stony	5	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	NORTON	1102	SIE12N	Cabot-Colonel complex, 8 to 15 percent slopes	12	Farmland of statewide importance, if drained	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	NORTON	13594	SIE12	Cabot-Colonel complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	NORTON	975	SIE33	Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy basal till	N/A
VT	NORTON	233	SIE53	Tunbridge-Lyman complex, 15 to 35 percent slopes, very rocky	25	Not prime farmland	No	C	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	NORTON	199	SIE41	Tunbridge-Peru-Wilmington complex, 0 to 8 percent slopes, very stony	4	Not prime farmland	No	D	loamy till	64
VT	NORTON	1043	SIE21	Wilmington-Colonel complex, 0 to 8 percent slopes, very stony	4	Not prime farmland	Yes	D	loamy basal till	N/A
VT	VICTORY	1136	SIE11	Cabot silt loam, 0 to 8 percent slopes, very stony	5	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	VICTORY	6108	SIE12	Cabot-Colonel complex, 8 to 15 percent slopes, very stony	12	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	VICTORY	815	SIE33	Peru-Colonel complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy basal till	N/A
VT	VICTORY	2822	SIE53	Tunbridge-Lyman complex, 15 to 35 percent slopes, very rocky	25	Not prime farmland	No	C	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	VICTORY	700	SIE52	Tunbridge-Lyman complex, 8 to 15 percent slopes, very rocky	12	Not prime farmland	No	D	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	46
VT	WATERFORD	303	20C	Buckland loam, 8 to 15 percent slopes	12	Farmland of statewide importance	No	C/D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone and/or loamy lodgment till derived from phyllite	N/A
VT	WATERFORD	4269	21C	Buckland loam, 8 to 15 percent slopes, very stony	12	Not prime farmland	No	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone and/or loamy lodgment till derived from phyllite	N/A
VT	WATERFORD	229	23B	Cabot silt loam, 0 to 8 percent slopes, very stony	5	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	WATERFORD	1580	23C	Cabot silt loam, 8 to 15 percent slopes, very stony	12	Not prime farmland	Yes	D	loamy lodgment till derived from mica schist and/or loamy lodgment till derived from limestone	N/A
VT	WATERFORD	1587	17D	Dummerston very fine sandy loam, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	B	loamy till	N/A
VT	WATERFORD	588	75D	Monadnock fine sandy loam, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	B	sandy and gravelly ablation till	N/A
VT	WATERFORD	408	104E	Urban land-Adams-Nicholville complex, 25 to 60 percent slopes	0	Not prime farmland	Unranked	N/A	N/A	N/A
VT	WATERFORD	768	56D	Vershire-Glover complex, 15 to 35 percent slopes, very rocky	25	Not prime farmland	No	C	loamy till	46

Soil Crossed by the GSPL Centerline										
State	**Town**	**Crossing Length (ft)**	**Map Unit Symbol (MUSYM)**	**Soil Name (muname)**	**Percent Slopes (slopegradd)**	**Prime Farmland (farmlndcl)**	**Hydric Soil Rating (Yes or No for Hydric – hydricrati)**	**Hydric Soil Group (hydgrpdcd)**	**Parent Material (pmgroupnam)**	Depth to Bedrock (brockdepmi)
VT	WATERFORD	607	214D	Vershire-Lombard complex, 15 to 35 percent slopes, very stony	25	Not prime farmland	No	C	loamy till	56
VT	WATERFORD	42	W	Water	0	Not prime farmland	Unranked	N/A	N/A	N/A
VT	WATERFORD	527	50A	Wonsqueak and Pondicherry mucks, 0 to 2 percent slopes	1	Not prime farmland	Yes	A/D	organic material over loamy till	N/A
NH	LITTLETON	2789	36E	Adams loamy sand, 15 to 60 percent slopes	38	Not prime farmland	No	A	sandy outwash derived mainly from granite, gneiss and schist	N/A
NH	LITTLETON	433	36B	Adams loamy sand, 3 to 8 percent slopes	6	Farmland of local importance	No	A	sandy outwash derived mainly from granite, gneiss and schist	N/A
NH	LITTLETON	741	73D	Berkshire loam, 15 to 25 percent slopes, very stony	20	Not prime farmland	No	A	till	N/A
NH	LITTLETON	477	72B	Berkshire loam, 3 to 8 percent slopes	6	All areas are prime farmland	No	A	till	N/A
NH	LITTLETON	1058	73C	Berkshire loam, 8 to 15 percent slopes, very stony	12	Farmland of local importance	No	A	till	N/A
NH	LITTLETON	392	22A	Colton loamy sand, 0 to 3 percent slopes	2	Farmland of local importance	No	A	stratified sandy and gravelly outwash derived from granite and gneiss	N/A
NH	LITTLETON	117	22E	Colton loamy sand, 15 to 60 percent slopes	38	Not prime farmland	No	A	stratified sandy and gravelly outwash derived from granite and gneiss	N/A
NH	LITTLETON	11	22B	Colton loamy sand, 3 to 8 percent slopes	6	Farmland of local importance	No	A	stratified sandy and gravelly outwash derived from granite and gneiss	N/A
NH	LITTLETON	692	295	Greenwood mucky peat	1	Not prime farmland	Yes	A/D	herbaceous organic material and/or woody organic material	N/A
NH	LITTLETON	533	347B	Lyme and Moosilauke soils, 3 to 8 percent slopes, very stony	6	Not prime farmland	Yes	A/D	till	N/A
NH	LITTLETON	1525	77D	Marlow fine sandy loam, 15 to 25 percent slopes, very stony	20	Not prime farmland	No	C	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	N/A
NH	LITTLETON	365	77E	Marlow fine sandy loam, 25 to 50 percent slopes, very stony	40	Not prime farmland	No	C	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	N/A
NH	LITTLETON	516	77C	Marlow fine sandy loam, 8 to 15 percent slopes, very stony	12	Farmland of local importance	No	C	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	N/A
NH	LITTLETON	256	255D	Monadnock and Hermon soils, 15 to 25 percent slopes, very stony	20	Not prime farmland	No	B	till	N/A
NH	LITTLETON	260	255E	Monadnock and Hermon soils, 25 to 35 percent slopes, very stony	30	Not prime farmland	No	B	till	N/A
NH	LITTLETON	3473	79B	Peru fine sandy loam, 0 to 8 percent slopes, very stony	4	Farmland of local importance	No	D	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	N/A
NH	LITTLETON	852	79D	Peru fine sandy loam, 15 to 25 percent slopes, very stony	20	Not prime farmland	No	D	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	N/A
NH	LITTLETON	4939	79C	Peru fine sandy loam, 8 to 15 percent slopes, very stony	12	Farmland of local importance	No	D	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	N/A
NH	LITTLETON	552	647B	Pillsbury fine sandy loam, 0 to 8 percent slopes, very stony	4	Not prime farmland	Yes	D	loamy lodgment till derived from gneiss and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from granite	N/A
NH	LITTLETON	732	61D	Tunbridge-Lyman-Rock outcrop complex, 15 to 25 percent slopes	20	Not prime farmland	No	C	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	N/A
NH	LITTLETON	2838	61E	Tunbridge-Lyman-Rock outcrop complex, 25 to 60 percent slopes	45	Not prime farmland	No	C	loamy supraglacial till derived from granite and gneiss and/or loamy supraglacial till derived from phyllite and/or loamy supraglacial till derived from mica schist	N/A
NH	LITTLETON	838	W	Water	0	Not prime farmland	Unranked	N/A	N/A	N/A
NH	MONROE	1155	36E	Adams loamy sand, 15 to 60 percent slopes	38	Not prime farmland	No	A	sandy outwash derived mainly from granite, gneiss and schist	N/A
NH	MONROE	1383	36B	Adams loamy sand, 3 to 8 percent slopes	6	Farmland of local importance	No	A	sandy outwash derived mainly from granite, gneiss and schist	N/A

Soil Crossed by the GSPL Centerline										
State	**Town**	**Crossing Length (ft)**	**Map Unit Symbol (MUSYM)**	**Soil Name (muname)**	**Percent Slopes (slopegradd)**	**Prime Farmland (farmlndcl)**	**Hydric Soil Rating (Yes or No for Hydric – hydricrati)**	**Hydric Soil Group (hydgrpdcd)**	**Parent Material (pmgroupnam)**	Depth to Bedrock (brockdepmi)
NH	MONROE	651	36C	Adams loamy sand, 8 to 15 percent slopes	12	Not prime farmland	No	A	sandy outwash derived mainly from granite, gneiss and schist	N/A
NH	MONROE	216	613	Croghan loamy fine sand	2	Farmland of statewide importance	No	A/D	sandy outwash derived mainly from granite, gneiss and schist	N/A
NH	MONROE	150	27B	Groveton fine sandy loam, 3 to 8 percent slopes	6	All areas are prime farmland	No	B	loamy outwash over sandy and/or gravelly outwash derived from granite and gneiss or schist	N/A
NH	MONROE	317	27C	Groveton fine sandy loam, 8 to 15 percent slopes	12	Farmland of local importance	No	B	loamy outwash over sandy and/or gravelly outwash derived from granite and gneiss or schist	N/A
NH	MONROE	303	28A	Madawaska fine sandy loam, 0 to 3 percent slopes	2	All areas are prime farmland	No	C	loamy outwash over sandy and/or gravelly outwash derived from granite and gneiss or schist	N/A
NH	MONROE	654	77D	Marlow fine sandy loam, 15 to 25 percent slopes, very stony	20	Not prime farmland	No	C	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	N/A
NH	MONROE	1001	76C	Marlow fine sandy loam, 8 to 15 percent slopes	12	Farmland of statewide importance	No	C	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	N/A
NH	MONROE	1650	79B	Peru fine sandy loam, 0 to 8 percent slopes, very stony	4	Farmland of local importance	No	D	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	N/A
NH	MONROE	795	78B	Peru fine sandy loam, 3 to 8 percent slopes	5	All areas are prime farmland	No	C/D	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	N/A
NH	MONROE	1482	79C	Peru fine sandy loam, 8 to 15 percent slopes, very stony	12	Farmland of local importance	No	D	loamy lodgment till derived from granite and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from phyllite	N/A
NH	MONROE	2827	647B	Pillsbury fine sandy loam, 0 to 8 percent slopes, very stony	4	Not prime farmland	Yes	D	loamy lodgment till derived from gneiss and/or loamy lodgment till derived from mica schist and/or loamy lodgment till derived from granite	N/A

Waterbodies Crossed by the GSPL Centerline						
STATE	NAME	Crossing ID	State Waterbody Name	HUC 12	Stream	Impaired Status
VT	NORTON	1		Averill Creek	Perennial	No
VT	NORTON	2		Averill Creek	Perennial	No
VT	NORTON	3		Averill Creek	Perennial	No
VT	NORTON	4		Averill Creek	Perennial	No
VT	NORTON	5	Averill Creek	Averill Creek	Perennial	No
VT	NORTON	6		Headwaters Coaticook River	Perennial	No
VT	NORTON	7		Headwaters Coaticook River	Perennial	No
VT	NORTON	8		Headwaters Coaticook River	Perennial	No
VT	NORTON	9		Headwaters Coaticook River	Perennial	No
VT	NORTON	10		Headwaters Coaticook River	Perennial	No
VT	NORTON	11		Headwaters Coaticook River	Perennial	No
VT	NORTON	12		Headwaters Coaticook River	Perennial	No
VT	NORTON	13		Headwaters Coaticook River	Perennial	No
VT	NORTON	14	Number Six Brook	Headwaters Coaticook River	Perennial	No
VT	AVERILL	15		Nulhegan River	Perennial	No
VT	LEWIS	16		Nulhegan River	Perennial	No
VT	LEWIS	17		Nulhegan River	Perennial	No
VT	LEWIS	18		Nulhegan River	Perennial	No
VT	LEWIS	19		Nulhegan River	Perennial	No
VT	LEWIS	20		Nulhegan River	Perennial	No
VT	LEWIS	21		Nulhegan River	Perennial	No
VT	BLOOMFIELD	22		Nulhegan River	Perennial	No
VT	BLOOMFIELD	23	Nulhegan River	Nulhegan River	Other	No
VT	BLOOMFIELD	24		Nulhegan River	Perennial	No
VT	BRUNSWICK	25		Nulhegan River	Perennial	No
VT	BRUNSWICK	26		Dennis Pond Brook-Connecticut River	Perennial	No
VT	BRUNSWICK	27	Notch Pond Brook	Dennis Pond Brook-Connecticut River	Perennial	No
VT	FERDINAND	28	Paul Stream	Paul Stream	Perennial	No
VT	FERDINAND	29		Paul Stream	Perennial	No
VT	FERDINAND	30	Paul Stream	Paul Stream	Perennial	No
VT	FERDINAND	31		Paul Stream	Perennial	No
VT	FERDINAND	32	Madison Brook	Paul Stream	Perennial	No
VT	GRANBY	33	Fitch Brook	Paul Stream	Perennial	No
VT	GRANBY	34		Paul Stream	Perennial	No
VT	GRANBY	35		Paul Stream	Perennial	No
VT	GRANBY	36		Paul Stream	Perennial	No
VT	GRANBY	37	Stony Brook	Paul Stream	Perennial	No
VT	GRANBY	38		Paul Stream	Perennial	No
VT	GRANBY	39	Tolman Brook	Paul Stream	Perennial	No

Waterbodies Crossed by the GSPL Centerline						
STATE	**NAME**	**Crossing ID**	**State Waterbody Name**	**HUC 12**	**Stream**	**Impaired Status**
VT	GRANBY	40		Paul Stream	Perennial	No
VT	GRANBY	41	Wilke Brook	Paul Stream	Perennial	No
VT	GRANBY	42	Pond Brook	Rogers Brook	Perennial	No
VT	VICTORY	43	Suitor Brook	Rogers Brook	Perennial	No
VT	VICTORY	44		Rogers Brook	Perennial	No
VT	VICTORY	45		Rogers Brook	Perennial	No
VT	VICTORY	46		Rogers Brook	Perennial	No
VT	VICTORY	47		Headwaters Moose River	Perennial	No
VT	LUNENBURG	48		Headwaters Moose River	Perennial	No
VT	LUNENBURG	49		Miles Stream-Connecticut River	Perennial	No
VT	LUNENBURG	50		Miles Stream-Connecticut River	Perennial	No
VT	LUNENBURG	51	Carr Brook	Miles Stream-Connecticut River	Perennial	No
VT	CONCORD	52	Carr Brook	Miles Stream-Connecticut River	Perennial	No
VT	CONCORD	53	Carr Brook	Miles Stream-Connecticut River	Perennial	No
VT	CONCORD	54		Miles Stream-Connecticut River	Perennial	No
VT	CONCORD	55	Miles Stream	Miles Stream-Connecticut River	Perennial	No
VT	CONCORD	56		Moore Reservoir-Connecticut River	Perennial	No
VT	CONCORD	57	Roaring Brook	Moore Reservoir-Connecticut River	Perennial	No
VT	CONCORD	58		Moore Reservoir-Connecticut River	Perennial	No
VT	CONCORD	59		Moore Reservoir-Connecticut River	Perennial	No
VT	CONCORD	60		Moore Reservoir-Connecticut River	Perennial	No
VT	CONCORD	61		Moore Reservoir-Connecticut River	Other	No
VT	CONCORD	62		Moore Reservoir-Connecticut River	Perennial	No
VT	CONCORD	63	Halls Brook	Moore Reservoir-Connecticut River	Perennial	No
VT	WATERFORD	64		Moore Reservoir-Connecticut River	Other	No
NH	LITTLETON	65	Connecticut River	Comerford Station Dam-Connecticut River	Other	Un-known
NH	LITTLETON	66		Comerford Station Dam-Connecticut River	Perennial	Un-known
NH	LITTLETON	67		Comerford Station Dam-Connecticut River	Intermittent	Un-known
NH	LITTLETON	68	Bill Little Brook	Comerford Station Dam-Connecticut River	Other	Un-known
NH	LITTLETON	69		Comerford Station Dam-Connecticut River	Intermittent	Un-known
NH	LITTLETON	70		Comerford Station Dam-Connecticut River	Intermittent	Un-known
NH	LITTLETON	71	Carter Brook	Comerford Station Dam-Connecticut River	Perennial	Un-known
NH	MONROE	72	Scarritt Brook	Comerford Station Dam-Connecticut River	Perennial	Un-known
NH	MONROE	73	Smith Brook	McIndoe Falls-Connecticut River	Perennial	Un-known

NWI Wetlands in Vermont Crossed by the GSPL Centerline					
State	**Town**	**Crossing ID***	**Length (Feet)**	**NWI Classification**	**Wetland Type**
VT	NORTON	1	42.436	R5UBH	Riverine
VT	NORTON	2	67.16	R5UBH	Riverine
VT	NORTON	3	95.0114	R5UBH	Riverine
VT	NORTON	4	27.5504	R5UBH	Riverine
VT	NORTON	5	26.4861	R3UBH	Riverine
VT	NORTON	6	26.2266	R5UBH	Riverine
VT	NORTON	7	29.8595	R5UBH	Riverine
VT	NORTON	8	26.3624	R5UBH	Riverine
VT	NORTON	9	35.8406	R5UBH	Riverine
VT	NORTON	10	30.8565	R5UBH	Riverine
VT	NORTON	11	26.9271	R5UBH	Riverine
VT	NORTON	12	39.0876	R5UBH	Riverine
VT	NORTON	13	26.7436	R5UBH	Riverine
VT	NORTON	14	32.0193	R5UBH	Riverine
VT	AVERILL	15	61.0011	R5UBH	Riverine
VT	LEWIS	16	616.0507	PSS1/4B	Freshwater Forested/Shrub Wetland
VT	LEWIS	17	26.5446	R3UBH	Riverine
VT	LEWIS	18	27.8196	R5UBH	Riverine
VT	LEWIS	19	27.0088	R5UBH	Riverine
VT	LEWIS	20	26.2692	R5UBH	Riverine
VT	LEWIS	21	26.245	R5UBH	Riverine
VT	BLOOMFIELD	22	33.9628	R5UBH	Riverine
VT	BLOOMFIELD	23	85.5969	R3UBH	Riverine
VT	BLOOMFIELD	24	30.6291	R5UBH	Riverine
VT	BRUNSWICK	25	55.9396	R5UBH	Riverine
VT	BRUNSWICK	26	26.7309	R5UBH	Riverine
VT	BRUNSWICK	27	57.3999	R3UBH	Riverine
VT	FERDINAND	28	215.6364	PFO4C	Freshwater Forested/Shrub Wetland
VT	FERDINAND	29	29.255	R5UBH	Riverine
VT	FERDINAND	30	26.4011	R5UBH	Riverine
VT	FERDINAND	31	87.7483	PFO4B	Freshwater Forested/Shrub Wetland
VT	FERDINAND	32	177.3466	PSS1C	Freshwater Forested/Shrub Wetland
VT	FERDINAND	33	321.5421	PFO4B	Freshwater Forested/Shrub Wetland
VT	FERDINAND	34	30.595	R5UBH	Riverine
VT	FERDINAND	35	27.0016	R3UBH	Riverine
VT	GRANBY	36	569.0388	PFO4/1B	Freshwater Forested/Shrub Wetland
VT	GRANBY	37	40.842	PFO4/1B	Freshwater Forested/Shrub Wetland
VT	GRANBY	38	401.7049	PFO4C	Freshwater Forested/Shrub Wetland
VT	GRANBY	39	34.5802	R5UBH	Riverine

NWI Wetlands in Vermont Crossed by the GSPL Centerline					
State	**Town**	**Crossing ID***	**Length (Feet)**	**NWI Classification**	**Wetland Type**
VT	GRANBY	40	27.6273	R5UBH	Riverine
VT	GRANBY	41	115.5924	R5UBH	Riverine
VT	GRANBY	42	479.9602	PFO4C	Freshwater Forested/Shrub Wetland
VT	GRANBY	43	41.1749	R5UBH	Riverine
VT	GRANBY	44	26.4219	R5UBH	Riverine
VT	GRANBY	45	36.5984	R3UBH	Riverine
VT	GRANBY	46	26.2751	R5UBH	Riverine
VT	GRANBY	47	9.1354	R5UBH	Riverine
VT	GRANBY	48	44.5047	R5UBH	Riverine
VT	GRANBY	49	27.8955	R5UBH	Riverine
VT	VICTORY	50	33.8028	R5UBH	Riverine
VT	VICTORY	51	36.1412	R5UBH	Riverine
VT	VICTORY	52	27.8638	R5UBH	Riverine
VT	VICTORY	53	26.6512	R5UBH	Riverine
VT	VICTORY	54	30.6128	R5UBH	Riverine
VT	LUNENBURG	55	36.8334	R5UBH	Riverine
VT	LUNENBURG	56	26.2004	R5UBH	Riverine
VT	LUNENBURG	57	26.201	R5UBH	Riverine
VT	LUNENBURG	58	134.0902	PFO4E	Freshwater Forested/Shrub Wetland
VT	CONCORD	59	174.484	PEM1Fb	Freshwater Emergent Wetland
VT	CONCORD	60	26.3109	R3UBH	Riverine
VT	CONCORD	61	26.6514	R5UBH	Riverine
VT	CONCORD	62	39.6629	R5UBH	Riverine
VT	CONCORD	63	29.154	R5UBH	Riverine
VT	CONCORD	64	166.0173	PEM1Fb	Freshwater Emergent Wetland
VT	CONCORD	65	183.308	PEM1Eb	Freshwater Emergent Wetland
VT	CONCORD	66	26.6037	R5UBH	Riverine
VT	CONCORD	67	71.7726	R5UBH	Riverine
VT	CONCORD	68	264.4701	L1UBHh	Lake
VT	CONCORD	69	29.221	R5UBH	Riverine
VT	CONCORD	70	27.3048	R5UBH	Riverine
VT	WATERFORD	71	634.6878	PEM1/FO5Fb	Freshwater Emergent Wetland

*Each time an NWI crossed the GSPL Centerline, it received a Crossing ID.

NWI Wetlands in New Hampshire Crossed by the GSPL Centerline					
State	**Town**	**Crossing ID***	**Crossing Length (Feet)**	**NWI Classification**	**Wetland Type**
NH	LITTLETON	1	367.41	L1UBHh	Lake
NH	LITTLETON	2	26.41	R5UBH	Riverine
NH	LITTLETON	3	20.46	R4SBC	Riverine
NH	LITTLETON	4	464.08	L1UBHh	Lake
NH	LITTLETON	5	21.16	R4SBC	Riverine
NH	LITTLETON	6	19.90	R4SBC	Riverine
NH	LITTLETON	7	30.94	R5UBH	Riverine
NH	MONROE	8	26.54	R5UBH	Riverine
NH	MONROE	9	33.61	R5UBH	Riverine

*Each time an NWI crossed the CL, it received a Crossing ID.

Land Use and Vegetation Crossed by the GSPL Centerline				
State	**Town**	**Crossing Length (Feet)**	**Vegetation**	**Land Use**
VT	NORTON	15.8379	Open Upland	Open Land
VT	NORTON	2749.167	Forest Upland	Forest
VT	NORTON	1259.78433	Forest Upland	Forest
VT	NORTON	23.25	Developed Land	Developed Land
VT	NORTON	190.1171	Forest Upland	Forest
VT	NORTON	104.0016	Open Upland	Open Land
VT	NORTON	740.2634	Forest Upland	Forest
VT	NORTON	34.0088	Developed Land	Developed Land
VT	NORTON	112.9692	Forest Upland	Forest
VT	NORTON	179.7682	Open Upland	Open Land
VT	NORTON	164.0913	Forest Upland	Forest
VT	NORTON	17.8435	Developed Land	Developed Land
VT	NORTON	2767.9614	Forest Upland	Forest
VT	NORTON	11.3635	Developed Land	Developed Land
VT	NORTON	386.5293	Forest Upland	Agriculture
VT	NORTON	42.3291	Forest Upland	Forest
VT	NORTON	220.2672	Open Upland	Open Land
VT	NORTON	301.2914	Forest Upland	Forest
VT	NORTON	40.5433	Open Upland	Open Land
VT	NORTON	53.4931	Developed Land	Developed Land
VT	NORTON	27.5041	Open Upland	Open Land
VT	NORTON	3443.9638	Forest Upland	Forest
VT	NORTON	64.4335	Open Upland	Open Land
VT	NORTON	2993.4763	Forest Upland	Forest
VT	NORTON	24.5747	Open Upland	Open Land
VT	NORTON	12.3237	Developed Land	Developed Land
VT	NORTON	144.7657	Open Upland	Open Land
VT	NORTON	1218.6429	Forest Upland	Forest
VT	NORTON	46.0263	Developed Land	Developed Land
VT	NORTON	90.4057	Forest Upland	Forest
VT	NORTON	21.7485	Developed Land	Developed Land
VT	NORTON	19.3881	Forest Upland	Forest
VT	NORTON	48.8266	Developed Land	Developed Land
VT	NORTON	65.6362	Forest Upland	Forest
VT	NORTON	26.7662	Developed Land	Developed Land
VT	NORTON	21.0004	Forest Upland	Forest
VT	NORTON	26.9899	Developed Land	Developed Land
VT	NORTON	311.2888	Forest Upland	Forest
VT	NORTON	22.8082	Developed Land	Developed Land
VT	NORTON	407.4624	Forest Upland	Forest
VT	NORTON	49.0712	Open Upland	Open Land
VT	NORTON	4466.6987	Forest Upland	Forest
VT	AVERYS GORE	3500.3909	Forest Upland	Forest
VT	AVERYS GORE	60.3185	Developed Land	Developed Land
VT	AVERYS GORE	67.3932	Forest Upland	Forest

Land Use and Vegetation Crossed by the GSPL Centerline				
State	**Town**	**Crossing Length (Feet)**	**Vegetation**	**Land Use**
VT	AVERILL	5920.4812	Forest Upland	Forest
VT	LEWIS	3058.2428	Forest Upland	Forest
VT	LEWIS	326.5351	Open Upland	Open Land
VT	LEWIS	78.2274	Developed Land	Developed Land
VT	LEWIS	138.3198	Open Upland	Open Land
VT	LEWIS	2215.6872	Forest Upland	Forest
VT	LEWIS	202.4876	Developed Land	Developed Land
VT	LEWIS	101.3498	Forest Upland	Forest
VT	LEWIS	616.0507	Open Wetland	Open Land
VT	LEWIS	1402.4029	Forest Upland	Forest
VT	LEWIS	194.1902	Developed Land	Developed Land
VT	LEWIS	1047.3696	Forest Upland	Forest
VT	LEWIS	85.0929	Open Upland	Open Land
VT	LEWIS	1915.3696	Forest Upland	Forest
VT	LEWIS	35.689	Open Upland	Open Land
VT	LEWIS	56.4428	Developed Land	Developed Land
VT	LEWIS	72.214	Open Upland	Open Land
VT	LEWIS	618.8079	Forest Upland	Forest
VT	LEWIS	149.0632	Open Upland	Open Land
VT	LEWIS	13558.9051	Forest Upland	Forest
VT	LEWIS	91.8469	Open Upland	Open Land
VT	LEWIS	4146.8448	Forest Upland	Forest
VT	LEWIS	45.3696	Open Upland	Open Land
VT	LEWIS	4950.6153	Forest Upland	Forest
VT	BLOOMFIELD	6232.3648	Forest Upland	Forest
VT	BLOOMFIELD	126.9789	Open Upland	Open Land
VT	BLOOMFIELD	3022.2094	Forest Upland	Forest
VT	BLOOMFIELD	18.9711	Open Upland	Open Land
VT	BLOOMFIELD	73.8756	Forest Upland	Forest
VT	BLOOMFIELD	48.6323	Open Upland	Open Land
VT	BLOOMFIELD	744.4133	Forest Upland	Forest
VT	BLOOMFIELD	142.2502	Open Upland	Open Land
VT	BLOOMFIELD	2086.4397	Forest Upland	Forest
VT	BLOOMFIELD	51.903	Open Upland	Open Land
VT	BLOOMFIELD	2858.4802	Forest Upland	Forest
VT	BLOOMFIELD	146.12	Open Upland	Agriculture
VT	BLOOMFIELD	3823.6491	Forest Upland	Forest
VT	BLOOMFIELD	82.5744	Open Upland	Open Land
VT	BLOOMFIELD	4499.9212	Forest Upland	Forest
VT	BLOOMFIELD	227.82	Forest Upland	Forest
VT	BLOOMFIELD	75.4429	Not Applicable	Open Water
VT	BLOOMFIELD	34.7851	Forest Upland	Forest
VT	BLOOMFIELD	379.8216	Forest Upland	Forest
VT	BLOOMFIELD	125.108	Open Upland	Open Land
VT	BLOOMFIELD	20.7332	Developed Land	Developed Land

Land Use and Vegetation Crossed by the GSPL Centerline				
State	**Town**	**Crossing Length (Feet)**	**Vegetation**	**Land Use**
VT	BLOOMFIELD	141.3382	Open Upland	Open Land
VT	BLOOMFIELD	179.3353	Forest Upland	Forest
VT	BLOOMFIELD	46.7671	Open Upland	Open Land
VT	BLOOMFIELD	22.3575	Forest Upland	Forest
VT	BLOOMFIELD	344.7592	Open Upland	Open Land
VT	BLOOMFIELD	259.2563	Forest Upland	Forest
VT	BLOOMFIELD	628.605	Open Upland	Open Land
VT	BLOOMFIELD	534.3959	Forest Upland	Forest
VT	BRUNSWICK	3106.2256	Forest Upland	Forest
VT	BRUNSWICK	22.2132	Open Upland	Open Land
VT	BRUNSWICK	343.2323	Forest Upland	Forest
VT	BRUNSWICK	31.4015	Open Upland	Open Land
VT	BRUNSWICK	974.6316	Forest Upland	Forest
VT	BRUNSWICK	31.9078	Developed Land	Developed Land
VT	BRUNSWICK	585.0413	Forest Upland	Forest
VT	BRUNSWICK	171.308	Open Upland	Open Land
VT	BRUNSWICK	5280.2175	Forest Upland	Forest
VT	BRUNSWICK	16.9441	Developed Land	Developed Land
VT	BRUNSWICK	1752.5558	Forest Upland	Forest
VT	BRUNSWICK	17.6413	Developed Land	Developed Land
VT	BRUNSWICK	276.6287	Forest Upland	Forest
VT	BRUNSWICK	29.0804	Developed Land	Developed Land
VT	BRUNSWICK	2355.6392	Forest Upland	Forest
VT	BRUNSWICK	9.3343	Developed Land	Developed Land
VT	BRUNSWICK	451.1959	Forest Upland	Forest
VT	BRUNSWICK	30.1583	Developed Land	Developed Land
VT	BRUNSWICK	492.4559	Forest Upland	Forest
VT	FERDINAND	3459.2473	Forest Upland	Forest
VT	FERDINAND	215.6364	Forest Wetland	Forest
VT	FERDINAND	1700.7677	Forest Upland	Forest
VT	FERDINAND	16.6711	Developed Land	Developed Land
VT	FERDINAND	83.9231	Forest Upland	Forest
VT	FERDINAND	42.722	Developed Land	Developed Land
VT	FERDINAND	172.3838	Forest Upland	Forest
VT	FERDINAND	91.7429	Open Upland	Open Land
VT	FERDINAND	337.426	Forest Upland	Forest
VT	FERDINAND	224.3022	Open Upland	Open Land
VT	FERDINAND	791.4379	Forest Upland	Forest
VT	FERDINAND	168.7935	Open Upland	Open Land
VT	FERDINAND	3461.7877	Forest Upland	Forest
VT	FERDINAND	166.7286	Open Upland	Open Land
VT	FERDINAND	1403.8639	Forest Upland	Forest
VT	FERDINAND	57.4746	Developed Land	Developed Land
VT	FERDINAND	70.4129	Forest Upland	Forest
VT	FERDINAND	66.9442	Forest Wetland	Forest

Land Use and Vegetation Crossed by the GSPL Centerline				
State	**Town**	**Crossing Length (Feet)**	**Vegetation**	**Land Use**
VT	FERDINAND	177.3466	Open Wetland	Open Land
VT	FERDINAND	321.5421	Forest Wetland	Forest
VT	FERDINAND	1757.717	Forest Upland	Forest
VT	FERDINAND	5922.8741	Forest Upland	Forest
VT	FERDINAND	124.0093	Developed Land	Developed Land
VT	FERDINAND	3736.0759	Forest Upland	Forest
VT	FERDINAND	24.312	Developed Land	Developed Land
VT	FERDINAND	5052.6611	Forest Upland	Forest
VT	GRANBY	0.0225	Forest Upland	Forest
VT	FERDINAND	0.0225	Forest Upland	Forest
VT	GRANBY	973.3143	Forest Upland	Forest
VT	GRANBY	569.0388	Forest Wetland	Forest
VT	GRANBY	1411.8742	Forest Upland	Forest
VT	GRANBY	40.842	Forest Wetland	Forest
VT	GRANBY	2456.1211	Forest Upland	Forest
VT	GRANBY	401.7049	Forest Wetland	Forest
VT	GRANBY	842.1885	Forest Upland	Forest
VT	GRANBY	18.9072	Developed Land	Developed Land
VT	GRANBY	7202.6785	Forest Upland	Forest
VT	GRANBY	17.8586	Forest Wetland	Forest
VT	GRANBY	15.4437	Developed Land	Developed Land
VT	GRANBY	446.6579	Forest Wetland	Forest
VT	GRANBY	248.8161	Forest Upland	Forest
VT	GRANBY	15.3122	Developed Land	Developed Land
VT	GRANBY	4098.1928	Forest Upland	Forest
VT	GRANBY	19.41	Developed Land	Developed Land
VT	GRANBY	63.2856	Forest Upland	Forest
VT	GRANBY	29.6162	Developed Land	Developed Land
VT	GRANBY	12727.8283	Forest Upland	Forest
VT	GRANBY	10.1206	Open Upland	Open Land
VT	GRANBY	239.2265	Forest Upland	Forest
VT	GRANBY	27.6933	Open Upland	Open Land
VT	GRANBY	215.6103	Forest Upland	Forest
VT	GRANBY	24.672	Developed Land	Developed Land
VT	GRANBY	1060.37	Forest Upland	Forest
VT	GRANBY	33.116	Developed Land	Developed Land
VT	GRANBY	439.456	Forest Upland	Forest
VT	GRANBY	42.7975	Developed Land	Developed Land
VT	GRANBY	1944.4355	Forest Upland	Forest
VT	GRANBY	12.1676	Developed Land	Developed Land
VT	GRANBY	9622.1218	Forest Upland	Forest
VT	VICTORY	2429.9352	Forest Upland	Forest
VT	VICTORY	103.2602	Open Upland	Open Land
VT	VICTORY	2890.5312	Forest Upland	Forest
VT	VICTORY	33.8201	Developed Land	Developed Land

Land Use and Vegetation Crossed by the GSPL Centerline				
State	**Town**	**Crossing Length (Feet)**	**Vegetation**	**Land Use**
VT	VICTORY	6123.6192	Forest Upland	Forest
VT	LUNENBURG	580.105	Forest Upland	Forest
VT	LUNENBURG	15.7835	Developed Land	Developed Land
VT	LUNENBURG	1912.2659	Forest Upland	Forest
VT	LUNENBURG	29.0483	Developed Land	Developed Land
VT	LUNENBURG	6671.8112	Forest Upland	Forest
VT	LUNENBURG	361.9187	Open Upland	Open Land
VT	LUNENBURG	3470.1709	Forest Upland	Forest
VT	LUNENBURG	28.1894	Developed Land	Developed Land
VT	LUNENBURG	666.7093	Forest Upland	Forest
VT	LUNENBURG	14.9785	Developed Land	Developed Land
VT	LUNENBURG	5945.6304	Forest Upland	Forest
VT	LUNENBURG	134.0902	Forest Wetland	Forest
VT	LUNENBURG	1141.3154	Forest Upland	Forest
VT	CONCORD	1541.8168	Forest Upland	Forest
VT	CONCORD	174.484	Open Wetland	Open Land
VT	CONCORD	399.0193	Forest Upland	Forest
VT	CONCORD	4707.2881	Forest Upland	Forest
VT	CONCORD	202.1105	Open Upland	Open Land
VT	CONCORD	830.115	Forest Upland	Forest
VT	CONCORD	154.2842	Open Upland	Open Land
VT	CONCORD	1104.0445	Forest Upland	Forest
VT	CONCORD	28.7677	Developed Land	Developed Land
VT	CONCORD	459.7422	Forest Upland	Forest
VT	CONCORD	46.3189	Not Applicable	Open Water
VT	CONCORD	8.432	Forest Upland	Forest
VT	CONCORD	2407.51	Forest Upland	Forest
VT	CONCORD	196.0734	Open Upland	Open Land
VT	CONCORD	2357.611	Forest Upland	Forest
VT	CONCORD	46.4278	Developed Land	Developed Land
VT	CONCORD	364.9323	Forest Upland	Forest
VT	CONCORD	65.9764	Developed Land	Developed Land
VT	CONCORD	146.4157	Open Upland	Open Land
VT	CONCORD	288.7844	Forest Upland	Forest
VT	CONCORD	26.9563	Developed Land	Developed Land
VT	CONCORD	590.705	Forest Upland	Forest
VT	CONCORD	128.2417	Open Upland	Open Land
VT	CONCORD	268.1259	Forest Upland	Forest
VT	CONCORD	1178.3449	Forest Upland	Forest
VT	CONCORD	1.4867	Open Upland	Open Land
VT	CONCORD	129.6187	Open Wetland	Open Land
VT	CONCORD	36.3986	Open Wetland	Open Land
VT	CONCORD	784.3784	Forest Upland	Forest
VT	CONCORD	17.2143	Open Upland	Open Land
VT	CONCORD	183.308	Open Wetland	Open Land

Land Use and Vegetation Crossed by the GSPL Centerline				
State	**Town**	**Crossing Length (Feet)**	**Vegetation**	**Land Use**
VT	CONCORD	15.1785	Open Upland	Open Land
VT	CONCORD	7311.7774	Forest Upland	Forest
VT	CONCORD	452.4747	Open Upland	Open Land
VT	CONCORD	791.0765	Forest Upland	Forest
VT	CONCORD	284.0945	Not Applicable	Open Water
VT	CONCORD	15455.4707	Forest Upland	Forest
VT	CONCORD	196.0243	Open Upland	Open Land
VT	CONCORD	41.7091	Forest Upland	Forest
VT	CONCORD	35.275	Developed Land	Developed Land
VT	CONCORD	926.07	Forest Upland	Forest
VT	CONCORD	17.6624	Developed Land	Developed Land
VT	CONCORD	1771.788	Forest Upland	Forest
VT	WATERFORD	3560.778	Forest Upland	Forest
VT	WATERFORD	7.672	Open Upland	Open Land
VT	WATERFORD	611.38	Open Wetland	Open Land
VT	WATERFORD	23.3079	Open Wetland	Open Land
VT	WATERFORD	1067.5707	Forest Upland	Forest
VT	WATERFORD	30.0609	Developed Land	Developed Land
VT	WATERFORD	3893.9493	Forest Upland	Forest
VT	WATERFORD	215.3608	Open Upland	Open Land
VT	WATERFORD	243.9313	Forest Upland	Forest
VT	WATERFORD	340.0617	Open Upland	Open Land
VT	WATERFORD	17.8691	Developed Land	Developed Land
VT	WATERFORD	98.1487	Open Upland	Open Land
VT	WATERFORD	343.2176	Forest Upland	Forest
VT	WATERFORD	251.9923	Open Upland	Open Land
VT	WATERFORD	117.6542	Forest Upland	Forest
VT	WATERFORD	42.5598	Open Upland	Open Land
VT	WATERFORD	41.2453	Not Applicable	Open Water
NH	LITTLETON	366.6907	Not Applicable	Open Water
NH	LITTLETON	471.35	Forest Upland	Forest
NH	LITTLETON	40.8928	Open Upland	Open Land
NH	LITTLETON	26.5091	Developed Land	Developed Land
NH	LITTLETON	414.4196	Forest Upland	Forest
NH	LITTLETON	42.0354	Developed Land	Developed Land
NH	LITTLETON	42.0336	Forest Upland	Forest
NH	LITTLETON	50.5704	Open Upland	Open Land
NH	LITTLETON	189.5186	Forest Upland	Forest
NH	LITTLETON	213.8657	Forest Upland	Forest
NH	LITTLETON	196.2644	Forest Upland	Forest
NH	LITTLETON	6931.7289	Forest Upland	Forest
NH	LITTLETON	36.7477	Developed Land	Developed Land
NH	LITTLETON	46.899	Forest Upland	Forest
NH	LITTLETON	29.1805	Developed Land	Developed Land
NH	LITTLETON	1014.0078	Forest Upland	Forest

Land Use and Vegetation Crossed by the GSPL Centerline				
State	**Town**	**Crossing Length (Feet)**	**Vegetation**	**Land Use**
NH	LITTLETON	31.3362	Open Upland	Open Land
NH	LITTLETON	925.9179	Forest Upland	Forest
NH	LITTLETON	16.9686	Developed Land	Developed Land
NH	LITTLETON	135.7145	Open Upland	Residential
NH	LITTLETON	31.5369	Not Applicable	Residential
NH	LITTLETON	119.4034	Open Upland	Residential
NH	LITTLETON	698.999	Forest Upland	Forest
NH	LITTLETON	508.5463	Not Applicable	Open Water
NH	LITTLETON	2595.6219	Forest Upland	Forest
NH	LITTLETON	16.3762	Developed Land	Developed Land
NH	LITTLETON	2122.2782	Forest Upland	Forest
NH	LITTLETON	50.8046	Developed Land	Developed Land
NH	LITTLETON	36.9068	Open Upland	Open Land
NH	LITTLETON	506.3028	Forest Upland	Forest
NH	LITTLETON	14.0868	Developed Land	Developed Land
NH	LITTLETON	854.8487	Forest Upland	Forest
NH	LITTLETON	675.0957	Open Upland	Agriculture
NH	LITTLETON	3547.0965	Forest Upland	Forest
NH	MONROE	1014.8845	Forest Upland	Forest
NH	MONROE	133.3539	Open Upland	Agriculture
NH	MONROE	43.7081	Developed Land	Developed Land
NH	MONROE	632.541	Open Upland	Agriculture
NH	MONROE	103.363	Open Upland	Open Land
NH	MONROE	564.3958	Open Upland	Agriculture
NH	MONROE	1372.4765	Forest Upland	Forest
NH	MONROE	770.5539	Open Upland	Open Land
NH	MONROE	27.9802	Forest Upland	Forest
NH	MONROE	128.4992	Open Upland	Open Land
NH	MONROE	17.5561	Developed Land	Developed Land
NH	MONROE	36.907	Forest Upland	Forest
NH	MONROE	15.5046	Open Upland	Open Land
NH	MONROE	52.7601	Forest Upland	Forest
NH	MONROE	164.6591	Open Upland	Open Land
NH	MONROE	248.1466	Forest Upland	Forest
NH	MONROE	163.5255	Open Upland	Open Land
NH	MONROE	832.0365	Forest Upland	Forest
NH	MONROE	1111.2185	Forest Upland	Forest
NH	MONROE	1614.5351	Forest Upland	Forest
NH	MONROE	63.2627	Developed Land	Developed Land
NH	MONROE	187.9033	Open Upland	Open Land
NH	MONROE	1688.5932	Forest Upland	Forest
NH	MONROE	39.9736	Developed Land	Developed Land
NH	MONROE	1456.747	Forest Upland	Forest

Federal and State Lands Crossed by the GSPL Line					
State	**Town**	**Crossing Length (ft)**	**Crossing ID**	**Name**	**Federal, State, Local**
VT	LEWIS	20,849	6	Conte National Wildlife Refuge	National Wildlife Refuge
VT	BLOOMFIELD	23,985	7	Conte National Wildlife Refuge	National Wildlife Refuge
VT	BRUNSWICK	5,476	10	West Mountain Wildlife Management Area	Wildlife Management Area
VT	BRUNSWICK	5,476	10	West Mountain WMA	Wildlife Management Area
VT	FERDINAND	29,687	11	West Mountain Wildlife Management Area	Wildlife Management Area
VT	FERDINAND	29,697	11	West Mountain WMA	Wildlife Management Area
VT	GRANBY	261	12	West Mountain WMA	Wildlife Management Area
VT	VICTORY	11,581	15	Victory State Forest	State Forest
VT	GRANBY	11	16	Victory State Forest	State Forest
VT	LUNENBURG	7,827	17	Victory State Forest	State Forest
NH	LITTLETON	3,210	18	National Conservation Easements (NCED)	Federal
NH	MONROE	2,265	19	National Conservation Easements (NCED)	Federal
NH	LITTLETON	1,223		State Of New Hampshire (undesignated land)	State

Roads and Railroads Crossed by the GSPL Centerline				
State	**Town**	**Crossing ID**	**Street/ Railroad Name**	**Federal or State**
VT	Norton	1	VT Route 114E	State
VT	Bloomfield	2	VT Route 105	State
VT	Bloomfield	3	Railroad	
VT	Ferdinand	4	S America Pond Rd	
VT	Ferdinand	5	Madison Brook Rd	
VT	Granby	6	Finch Brook Rd	
VT	Granby	7	DC Line Rd	
VT	Granby	8	Stony Brook Rd	
VT	Granby	9	DC Line Rd	
VT	Granby	10	Tolman Brook Rd	
VT	Granby	11	Old County Rd	
VT	Granby	12	Granby Rd	
VT	Granby	13	DC Line Rd	
VT	Granby	14	DC Line Rd	
VT	Granby	15	DC Line Rd	
VT	Lunenburg	16	Unnamed 11	
VT	Concord	17	E Concord Rd	
VT	Concord	18	Railroad	
VT	Concord	19	Leonard Hill Rd	
VT	Concord	20	Grist Mill Pit Rd	
VT	Waterford	21	Old County Rd	
NH	Littleton	22	Dam Access Road	
NH	Littleton	23	St Johnsbury Road	State
NH	Littleton	24	Interstate 93 N	Federal
NH	Littleton	25	Interstate 93 S	Federal
NH	Littleton	26	Monroe Rd	State

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

EXHIBIT H

Public Involvement and Agency Coordination

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

Media Coverage

Articles total through 11/27/2017: 172

	Date	Publication	Headline	Circulation/ Location
172	November 21, 2017	AP	Officials discuss proposed $1.1B power transmission project	AP Newswire
171	November 20, 2017	Caledonian Record	Granite State Power Link introduced non-profit energy co. partner	10,204/St Johnsbury, VT
170	November 20, 2017	InDepthNH	Appraiser Sonsoucy Criticizes Northern Pass Property Valuations	Online publication, NH
169	November 14, 2017	Concord Monitor	'How do you buy clean power?' and other questions electrify Science Cafe	22,700/Concord, NH
168	November 12, 2017	Commonwealth Magazine	Natl Grid finds novel way to lobby clean energy procurement	Massachusetts political publication
167	November 12, 2017	Mass Live	Transmission developer TDI offers $20 million for Western Massachusetts home energy retrofits if it wins statewide clean electricity contract	Online news site serving Western Massachusetts
166	October 27, 2017	NH Business Review	**Region's renewable needs spark a NH solar surge**	12,500/bi-monthly Manchester, NH
165	October 12, 2017	NH Union Leader	Consultant questions whether Bay State will accept power project without approvals	45,500/Manchester, NH
164	October 10, 2017	Commonwealth Magazine	Utilities on both sides of the bargaining table	Massachusetts political publication
163	October 9, 2017	RTO Insider	Tx Developers Pitch Mass. Clean Energy Bids	Industry publication
162	September 24, 2017	The Boston Globe	A massive project demands basic transparency	245,000/Boston, MA

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

	Date	Publication	Headline	Circulation/ Location
161	September 21, 2017	InDepthNH	Study: Granite State Power Link Bests Northern Pass on CO2 Reductions	Digital Publication / New Hampshire
160	September 17, 2017	NewsLINC	Granite State Power Link Proposal	Vermont online blog
159	August 30, 2017	NHPR	Executive Councilor: Sununu Needs To Do More Outreach On Northern Pass	NH Public Radio
158	August 24, 2017	Windpower Engineering & Development	Another step toward wind-energy exportation in Canada	Trade publication
157	August 22, 2017	Utility Dive	Northern Pass transmission project gets DOE environmental nod	Trade publication
156	August 17, 2017	Canwea	Another step towards wind energy exportation	Canadian Wind organization
155	August 13, 2017	Westerly Sun	 WesterlySun 81317.pdf	6,551 / Westerly, RI
154	August 12, 2017	The News & Observer	Massachusetts pushing ahead with renewable energy initiative	121,441 / Raleigh, NC
153	August 10, 2017	WBUR.org	Northern New Englanders Hesitant to Host Renewable Power Channels to Mass	Public Radio / Boston, MA
152	August 7, 2017	New England Public Radio	Should Northern New England Host Massachusetts' Energy Extension Cord?	Public Radio / Springfield, MA
151	August 6, 2017	Community Newspaper Holdings	Massachusetts to weigh plans for green power	Owner of various newspapers in US
150	August 6, 2017	Haverhill Gazette	Massachusetts to weigh plans for green power	3,900 / Haverhill,MA
149	August 5, 2017	The Daily News of Newburyport	Green power companies bid to bring alternative power to Mass	9,600 / Newburyport, MA
148	August 3, 2017	Climate Action Business Associate (CABA)	What you need to know about the new Mass. Clean Energy Project Proposals	Membership organization

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

	Date	Publication	Headline	Circulation/ Location
147	August 2, 2017	Seven Days VT	Power Grab Could Seal the Fate of Underwater Transmission Lines	Weekly newspaper / Burlington, VT
146	August 1, 2017	ABC 6	Deepwater Wind Plans Offshore Farm  20170801100000_full.flv4VinBx	ABC6.com/Providence, RI
145	August 1, 2017	Cape Cod Times	Deepwater Wind taking 2 shots at Massachusetts energy procurement	39,000/Barnstable, MA
144	July 31, 2017	Utility Dive	5 companies propose transmission projects for Massachusetts clean energy RFP	Industry publication
143	July 31, 2017	WGRB	Utility offers energy proposals under state energy law	Albany, NY
142	July 31, 2017	Commonwealth Magazine	Offshore wind farm bids against hydro, onshore wind firms	Boston, MA
141	July 31, 2017	AP	Offshore Wind Developer Announces Clean Energy Project	
140	July 31, 2017	Recharge news	Emera proposes 1.2GW of Canadian wind exports to New England	Wind trade publication/ Oslo, Norway
139	July 30, 2017	The Westerly Sun	Utilities competing to provide clean power to Massachusetts	10,000/Westerly, RI
138	July 29, 2017	Wicked Local Waltham	Bidders want to bring Canadian hydro to Massachusetts	Online media/Waltham, MA
137	July 29, 2017	Concord Monitor	Northern Pass competes for Mass energy deal	22,700/Concord, NH
136	July 29, 2017	WickedLocal	Bidders want to bring Canadian Hydro to Massachusetts	Online news/Randolph, MA
135	July 29, 2017	MetroWest Daily News	Business Digest for July 29, 2017	17,542/Framingham, MA

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

	Date	Publication	Headline	Circulation/ Location
134	July 28, 2017	North American Windpower	What's Been Proposed So Far For Massachusetts' Clean Energy RFP?	Industry publication/Oxford, CT
133	July 28, 2017	Worcester Business Journal	Proposals would bring hydropower to Massachusetts	30,000/Worcester, MA
132	July 28, 2017	WBZ 1030 AM	 20170728120000_full.flvsDTEQ John Flynn on GSPL	AM Radio/ Boston, MA
131	July 27, 2017	NewsOK / The Oklahoman	Utilities competing to provide clean energy to Massashusetts	124,667 / Oklahoma City, OK
130	July 27, 2017	Greenfield Recorder	Utilities competing to provide clean energy to Mass	11,253 / Greenfield, MA
129	July 27, 2017	SNL	Transmission developers submit bids for Mass clean energy RFP	Industry publication/ New York, NY
128	July 27, 2017	Greenfield Recorder	Utilities competing to provide clean power to Massachusetts	11,253/Greenfield, MA
127	July 27, 2017	US News & Report	Utilities Competing to Provide Clean Power to Massachusetts	
126	July 27, 2017	Commonwealth Magazine	Hydro-Quebec partners up	Boston, MA
125	July 27, 2017	The Salem News	Bidders vow to bring Quebec hyrdo to Massachusetts	20,000/Salem, MA
124	July 27, 2017	NH Public Radio	Eversource and National Grid, Among Others, Competing for Mass. Energy Contracts	Public radio/Concord, NH
123	July 27, 2017	MassLive.com	5 major transmission, hydro and wind partners bid into Mass Clean Energy RFP	Online media
122	July 27, 2017	The Boston Globe	Power companies line up to seek big state-managed contract for clean power	245,000 / Boston, MA

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

	Date	Publication	Headline	Circulation/ Location
121	July 27, 2017	RTO Insider	Hydro-Quebec Dominates Mass. Clean Energy Bids	Trade journal/Potomac, MD
120	July 27, 2017	NH Union-Leader	Northern Pass in-service date pushed back	45,500/ Manchester, NH
119	July 27, 2017	WAMC/Northeast Public Radio	National Grid's Plan to Run Power Line Through MA, NY Towns	Public Radio, Western Mass
118	July 27, 2017	Portland Press Herald	CMP wants to build 145-mile transmission line through western Maine	37,776/Portland, ME
117	July 26, 2017	Berkshire Eagle	Some answers, but more questions in Northeast Renewable Link endeavor	23,385/Pittsfield, MA
116	July 25, 2017	iBerkshires	National Grid Plans New Transmission Line Through Seven Towns	North Adams, MA
115	July 21, 2017	Concord Monitor	More than 100 legislators among Northern Pass opposition	22,700/Concord, NH
114	July 19, 2017	New Hampshire Public Radio	Webster residents weigh in on proposed power line	Public Radio/NH
113	July 19, 2017	Concord Monitor	Letter: Fight the Power	22,700/Concord, NH
112	July 16, 2017	Concord Monitor	Editorial: Bridging the gap of energy eras	22,700/Concord, NH
111	July 14, 2017	New Hampshire Public Radio	National Grid Holding 'Community Meetings' on Proposed Transmission Project	Public Radio/NH
110	July 13, 2017	InDepthNH.org	Pressure Mounts As Northern Pass Hearings Continue	Digital news site/ NH
109	July 13, 2017	Caledonian Record	Granite State Power Link Offers Littleton Residents A Look At Project	10,204/Northeast Kingdom, VT
108	July 12, 2017	Concord Monitor	Public meetings start for Granite State Power Link, a Northern Pass-like proposal	22,700/Concord, NH

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

	Date	Publication	Headline	Circulation/ Location
107	July 7, 2017	WBZ 1030 AM Radio	Project mention  20170707220000_full.flvJw9lE7.	Boston, MA
106	July 7, 2017	New Media Militia	National Grid, electrical workers reach agreement on project	NH news blog
105	July 7, 2017	APNews.com	National Grid, electrical workers reach agreement on project	New York City, NY
104	July 7, 2017	New England Energy News . com	Energy News for week ending July 7, 2017	NE Energy Blog
103	July 7, 2017	Derry news	Councilors hear details on power project	Derry, NH/circulation not known/Facebook: 4,061 likes
102	July 7, 2017	NH1.com	National Grid, electrical workers reach agreement on project	Online media, Concord, NH
101	July 7, 2017	The News Tribune	National Grid, Electric Workers Reach Agreement on Project	54,088/Tacoma, WA
100	July 7, 2017	Vermont Business Magazine	National Grid, union sign MOU for Granite State Power Link	35,000/Burlington, VT *the link was also shared on LabourStart, a trade union blog. The link has been shared on teamsterslocal104.com and amfa4.com.
99	July 7, 2017	NH Union-Leader	National Grid, IBEW to build Granite State Power Link project	140,000/Manchester, NH
98	July 7, 2017	US News	National Grid, Electric Workers Reach Agreement on Project	Online media
97	July 5, 2017	The News and Sentinel	Granite State Power Link Continues to Hold Local Community Meetings	Colebrook, NH

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

	Date	Publication	Headline	Circulation/ Location
96	June 21, 2017	VT Digger	Power import plan runs into grid capacity limits	14,000/Montpelier, VT
95	June 18, 2017	Sentinel Source	From Yale to the North Country, Northern Pass elicits strong opinions	9,000/Keene, NH
94	June 17, 2017	Caledonian Record	New NEK Power Line Would Ship Big Wind Power To Mass.	10,204/Northeast Kingdom, VT
93	June 17, 2017	Berlin Daily Sun	First Site Evaluation Committee Public Hearing on Northern Pass Draws Mixed Comments	8,500/Berlin, NH
92	May 31, 2017	Berlin Daily Sun	Hydro-Quebec explores opportunities in New England and New York	8,500/Berlin, NH
91	May 26, 2017	T&D World	Who Says the Era of Long-Haul Billion-Dollar Projects is Behind Us?	212,028/Trade Publication
90	May 26, 2017	WNPR Radio	Discussion on MA RFP Process and three project, including GSPL	Hartford, CT
89	May 22, 2017	Conservation Law Foundation	The Northern Pass Project Has Become a Dinosaur and Should Be Rejected	Blog
88	May 11, 2017	Industrial Info	U.S. Power Grid Upgrades in Full Swing	Blog
87	May 9, 2017	Concord Monitor	Hearings reveal true cost of Northern Pass	22,700/Concord, NH
86	May 4, 2017	The Journal Record	Power line proposal could reopen remote Vermont land debate	Oklahoma

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

	Date	Publication	Headline	Circulation/ Location
73-85	April 30, 2017	Associated Press picked up by: Brattleboro Reformer (Brattleboro, VT) US News & Report Jackson Hole News and Guide (Jackson Hole, WY) Environment Guru WorldNews Network CT Scoop The State (Columbia, SC) Vermont Business Magazine News 10 (Albany, NY) Montana News Report Laconia Daily Sun (Laconia, NH) The Berkshire Eagle (Pittsfield, MA) (23,835) The Journal Record (Oklahoma) ABC6 (Providence) NHAngle.com (part of NH Union Leader) SFGate (San Francisco, CA) New Haven Register (New Haven, CT) Valley News (West Lebanon, NH)	Power line proposal could reopen remote Vermont land debate	
72	April 25, 2017	Caledonian Record	Granite State Power Link Makes Pitch To Littleton	10,204/Northeast Kingdom, VT
71	April 19, 2017	Caledonian Record	National Grid To Meet More Select Boards In NEK	10,204/Northeast Kingdom, VT
70	April 18, 2017	Andover Beacon	Select Board Minutes: April 17, 2017	1,100/Andover, NH
69	April 13, 2017	Valley News	Northern Pass Hearings Begin	16,000/West Lebanon, NH
68	April 13, 2017	NH Union Leader	Northern Pass 'trial' begins before state evaluation panel	45,536/Manchester, NH

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

	Date	Publication	Headline	Circulation/ Location
67	April 13, 2017	WMUR Picked up by: LMTOnline (Laredo, TX) WRAL (Raleigh, NC) U.S. News & Report	What you need to know about Northern Pass as critical hearing beings	Radio
66	April 12, 2017	Londonderry News	Switching Station Proposed in Londonderry as Part of Power Link Project	Londonderry, NH
65	April 12, 2017	Concord Monitor	Northern Pass gets day in court Thursday as committee hearings start	22,700/Concord, NH
64	April 11, 2017	NH Union Leader	New Granite State Power Link project rich in rights – of way	45,536/Manchester, NH
63	April 5, 2017	Engineering News-Record	National Grid Proposes New $1-Billion Transmission Project	47,812/Trade Publication
62	April 4, 2017	Engineering360	National Grid Eyes HDVC Line for New England	8,000,000/Trade Publication
61	April 4, 2017	Concord Monitor	A messy 'junk drawer' can be more dangerous than you think, and other techy bits	22,700/Concord, NH
60	April 4, 2017	Tradition Energy	With New Project, National Grid Puts Forward Possible Alternative to Northern Pass	Blog
59	April 4, 2017	Utility Dive	National Grid proposed 1200MW Canada-New England transmission line	370,000/Trade Publication
58	April 2, 2017	Colebrook Chronicle	National Grid Proposes Powerline Using Existing Vt. Line	6,000/Colebrook, NH
57	April 2, 2017	NH Union Leader	Dueling plans to deliver more power	45,636/Manchester, NH

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

	Date	Publication	Headline	Circulation/ Location
56	March 31, 2017	New England Energy News	Energy News for week ending March 31, 2017	Blog
55	March 31, 2017	NH Public Radio	Weekly NH News Roundup: March 31, 2017	Radio
54	March 31, 2017	Public Power Daily	Utility proposes Canada-to-U.S. transmission line project	Trade Publication
53	March 31, 2017	Solar Power World	Proposed transmission project could bring solar from Canada to New England	13,000/Trade Publication
52	March 30, 2017	Windpower Engineering	National Grid proposes transmission project: 1200 MW from Canada	10,000/Trade Publication
51	March 30, 2017	Concord Monitor	Senate approves bill that could revive purchase of Northern Pass power	22,700/Concord, NH
50	March 30, 2017	La Presse.Ca	Le New Hampshire ne veut pas d'électricité du Québec	1,716,000/Digital News
49	March 30, 2017	NH Union Leader	Northern Pass opponents seek delay of SEC hearings	45,536/Manchester, NH
48	March 30, 2017	Berlin Daily Sun	National Grid dives into the Quebec to New England Energy Fray	8,500/Berlin, NH
47	March 30, 2017	The Boston Globe	National Grid/Eversource showdown; McD's is fresh, more	245,824/Boston, MA
46	March 30, 2017	Electric Light & Power	National Grid proposes Canada-New England clean energy power line	30,000/Trade publication
45	March 30, 2017	Utility Dive	National Grid's proposed transmission line will ship 1.2MW of renewables from Canada	370,000/Trade Publication

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

	Date	Publication	Headline	Circulation/ Location
44	March 30, 2017	Concord Monitor	Northern Pass opponents say they've hoped for something like the National Grid plan	22,700/Concord, NH
43	March 30, 2017	Caledonian Record	National Grid Proposes 1200 MW Transmission Line	10,204/Northeast Kingdom, VT
42	March 30, 2017	EnergyWire	National Grid plans to import hydropower from Quebec	Digital Trade Publication
41	indepthMarch 29, 2017	Forest Society of New Hampshire	National Grid Proposes Alternative to Northern Pass	Blog
40	March 29, 2017	Citizens Count NH, Live Free or Die Alliance	Competition for Northern Pass?	Blog
39	March 29, 2017	National Wind Watch	Power Plan includes Haverhill	Blog
38	March 29, 2017	NH Union Leader	Northern Pass critics and supporters hail National Grid transmission project	45,536/Manchester, NH
37	March 29, 2017	Le Journal de Quebec	Exportations d'electricite: d'austres mauvaises nouvelles pour Hydro	3,000,000/Montreal , QC
36	March 29, 2017	Fosters Daily	National Grid dives into the Quebec to New England energy fray	55,800/Dover, NH
35	March 29, 2017	VT Digger	KINGDOM ROUTE EYED FOR POWER LINE TO MASSACHUSETTS	14,000/Montpelier, VT
34	March 29, 2017	Energy Manager Today	Granite State Power Link Could Reduce New England Energy Costs by $1B Over 10 Years	Trade Publication
33	March 29, 2017	Caledonian Record	Does Northern Pass Have A Competitor?	10,204/Northeast Kingdom, VT
32	March 29, 2017	Valley News	Power Plan Line Includes Haverhill	16,000/West Lebanon, NH

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

	Date	Publication	Headline	Circulation/ Location
31	March 29, 2017	InsideSources	This Week Has Seen Major Setbacks For Eversource, Northern Pass. Here's Why.	25,000,000/Digital Publication
30	March 28, 2017	Financial Times	National Grid Proposes New Transmission Project: Would Provide Host Community Benefits, Help Secure New England's Clean Energy Future	2,000,000
29	March 28, 2017	The Recorder	National Grid proposes 1,200-megawatt New England project	17,295/Greenfield, MA
28	March 28, 2017	New York Times	National Grid Proposes New Transmission Project	2,771,500/New York, NY
27	March 28, 2017	Manchester Ink Link	National Grid dives into the Quebec to New England energy fray	180,000/Manchester, NH
26	March 28, 2017	S&P Global Platts	National Grid plans power line for imports from Canada	Portland, ME
25	March 28, 2017	ValueWalk	This Week Has Seen Major Setbacks For Eversource, Northern Pass. Here's Why.	1,500,000/Digital Publication
24	March 28, 2017	Transmission Hub	National Grid proposes approximately $1bn, 170-mile Granite State Power Link	Trade Publication
23	March 28, 2017	NH Public Radio	With New Project, National Grid Puts Forward Possible Alternative to Northern Pass	Radio
22	March 28, 2017	NH Union Leader	Now National Grid wants a NH transmission line to import Canadian power too	45,536/Manchester, NH

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

	Date	Publication	Headline	Circulation/ Location
21	March 28, 2017	Caledonian Record	National Grid proposes 1,200-megawatt New England project	10,204/Northeast Kingdom, VT
20	March 28, 2017	Vermont Business Magazine	1.2 GW Granite State Power Link proposed, would start in Vermont	35,000/Burlington, VT
19	March 28, 2017	WCAX	National Grid proposes 1,200-megawatt New England project	Burlington, VT
18	March 28, 2017	NH Business Review	National Grid proposes NH-Vt. high-power transmission line	1,000/Manchester, NH
17	March 28, 2017	Concord Monitor	National Grid proposes a Northern Pass-like power line from Quebec	22,700/Concord, NH
16	March 28, 2017	InDepthNH	National Grid dives into the Quebec to New England energy fray	Digital Publication
15	March 28, 2017	San Luis Obispo Tribune	National Grid proposes 1,200-megawatt New England project	San Luis Obispo, CA
14	March 28, 2017	Business Wire	National Grid Proposes New Transmission Project: Would Provide Host Community Benefits, Help Secure New England's Clean Energy Future	Newswire

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

	Date	Publication	Headline	Circulation/ Location
1-13	March 28, 2017	Yahoo Finance WDRB.com – Louisville, KY NewsOn6.com – Tulsa, OK 9&10News – Cadillac, MI Oil&Gas360 CBS58 – Milwaukee, WI News9.com – Oklahoma City, OK Newschannel10.com – Amarillo, TX CBS8 – San Diego, CA WFMJ.com – Youngstown, OH ABC6, WLNE – Providence, RI US News & Report Stratton Report	Reprint of National Grid GSPL press release	

GRANITE STATE POWER LINK
A Ready Path to Clean Energy

Recorded Project Supporters

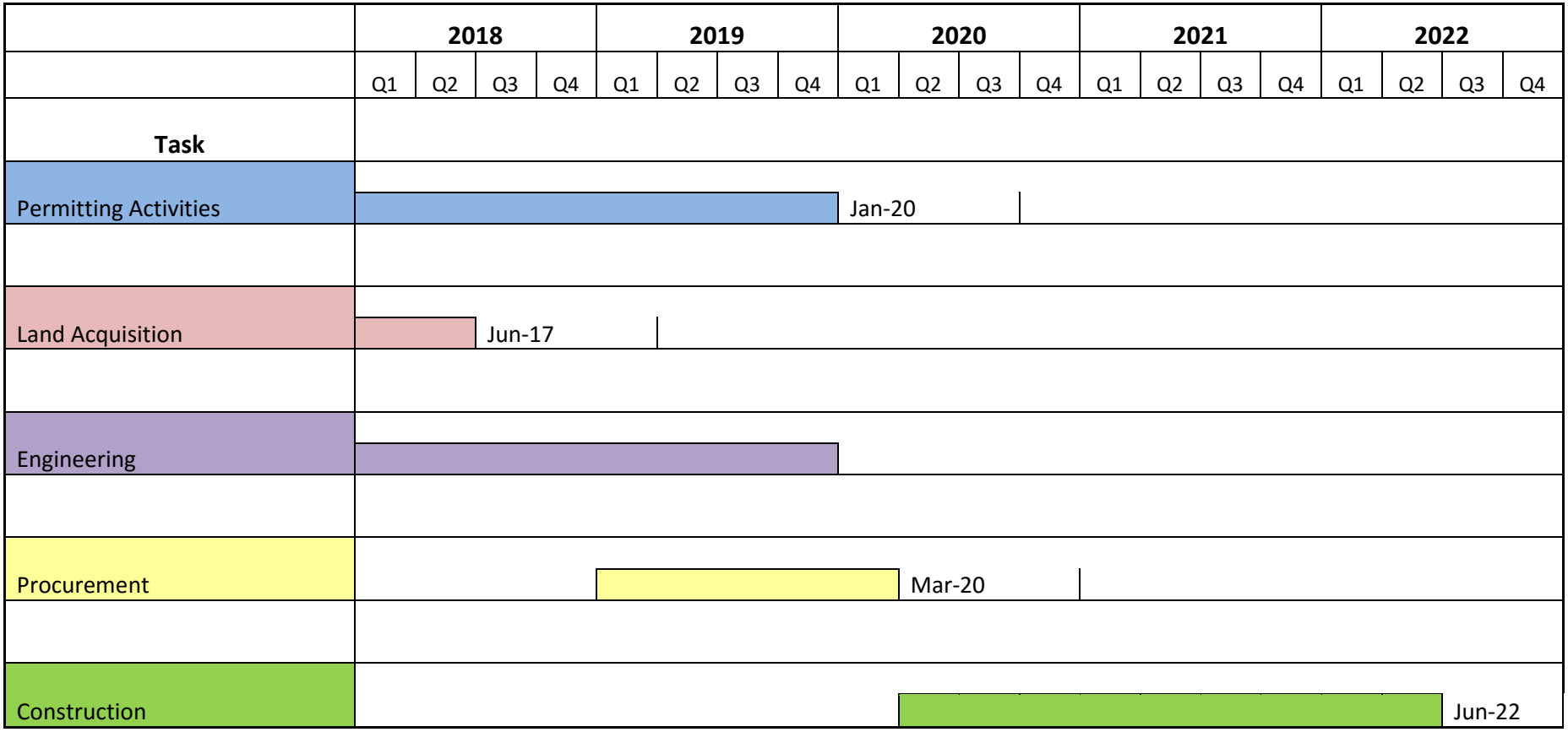
Vermont	New Hampshire
State Senators from the Northeast Kingdom of Vermont representing the project route towns	22 State Representatives from various towns and cities throughout New Hampshire
State House Representatives from the Northeast Kingdom of Vermont representing the project route towns	State Senator Bob Giuda, representing several project route towns
Town of Waterford, a project route town	State Senator Lou D'Allesandro, representing Goffstown, a project route town
Vermont Association of Snow Travelers (VAST)	Grafton County Commissioner Linda Lauer, representing project route area
Northeastern Vermont Development Association (NVDA), representing all communities within the Northeast Kingdom of Vermont, including all project route towns	Town of Goffstown, NH
Town of Concord, a project route town	Central New Hampshire Chamber of Commerce
Town of Lunenburg, a project route town	Mike Ahern, Plymouth, NH Board of Selectman member and local businessman
Unified Towns and Gores, project route communities	Town of Salisbury, NH
	Town of Plymouth, NH

In addition, the Project has received written support from over 50 area residents and the International Brotherhood of Electrical Workers 103 (Boston, Massachusetts).

EXHIBIT I

Project Schedule

GSPL Major Activity Schedule



GRANITE STATE POWER LINK
A Ready Path to Clean Energy

EXHIBIT J

Verification of Application

VERIFICATION OF GRIDAMERICA HOLDINGS INC.

Pursuant to 10 C.F.R. § 205.322(e), I, William Hazelip, first being duly sworn, depose and state as follows:

1. I am the Vice President, and an officer, of GridAmerica Holdings Inc.

2. I am legally authorized to bind GridAmerica Holdings Inc., and have the authority to verify the foregoing Application of GridAmerica Holdings Inc. for a Presidential Permit for the Granite State Power Link project.

3. I have read the Application and am familiar with the Granite State Power Link project. While I do not have direct, firsthand knowledge of each matter addressed in the Application, all matters have been assembled by authorized employees and counsel under my direction and supervision and are true to the best of my information and belief.

GRIDAMERICA HOLDINGS INC.

By: William Hazelip

Its: Vice President

Subscribed to and sworn before me, a notary public, this 22 day of December, 2017.

Notary Public

My Commission expires: _____

AILSA D. MCMENEMY
Notary Public
Commonwealth of Massachusetts
My Commission Expires
February 5, 2021