STATE OF VERMONT
PUBLIC SERVICE BOARD

Petition of Champlain VT, LLC d/b/a TDI New England for a Certificate of Public Good, pursuant to 30 V.S.A. §248, authorizing the installation and operation of a high voltage direct current (HVDC) underwater and underground electric transmission line with a capacity of 1,000 MW, a converter station, and other associated facilities, to be located in Lake Champlain and in the Counties of Grand Isle, Chittenden, Addison, Rutland, and Windsor, Vermont, and to be known as the New England Clean Power Link Project ("NECPL")	)	Docket No. _____

PREFILED DIRECT TESTIMONY OF JEFFREY NELSON

ON BEHALF OF CHAMPLAIN VT, LLC

December 8, 2014

Summary:

Mr. Nelson provides testimony concerning the terrestrial segments of the NECPL with respect to water purity, water pollution, headwaters, floodways, streams, shorelines, wetlands, water conservation, sufficiency of water, burden on existing supply, soil erosion, waste disposal, and outstanding resource waters, pursuant to 30 V.S.A. § 248(b)(5) and (8).

Exhibit Number	Name of Exhibit
TDI-JAN-1	Resume
TDI-JAN-2	Natural Resources Report - Overland (Narrative) (VHB)
TDI-JAN-3	Natural Resources Map Series (Partial Appendix 1 of TDI-JAN-2) – Oversize, Vol. 5
TDI-JAN-4	Wetlands Summary Table (Partial Appendix 2 of TDI-JAN-2)
TDI-JAN-5	Streams Summary Table (Partial Appendix 2 of TDI-JAN-2)
TDI-JAN-6a-c	(a) Representative Photographs – Streams (b) Representative Photographs – Wetlands (c) Representative Photographs – Land Use (Partial Appendix 4 of TDI-JAN-2)
TDI-JAN-7	Stormwater Technical Memorandum (VHB)
TDI-JAN-8	Stream Alteration Review Report (VHB)
TDI-JAN-9a	Stream Alteration Review Index Map (Appendix 1 of TDI-JAN-8)

TDI-JAN-9b	Table of Proposed Stream Crossings (Appendix 2 of TDI-JAN-8)
TDI-JAN-10	Wetland Impact Analysis and Table (VHB)
TDI-JAN-11a	Water Supply Impact Analysis (VHB)
TDI-JAN-11b	Water Supply Maps (VHB) – Oversize, Vol. 5
TDI-JAN-12	Vegetation Management Plan (VHB)

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Q1. Please state your name, occupation, and business address.

A1. Response: My name is Jeffrey A. Nelson, and I am the Director of Energy and Environmental Services for the Vermont office of Vanasse Hangen Brustlin, Inc. ("VHB"), located at 7056 U.S. Route 7 in North Ferrisburgh, Vermont.

Q2. Please describe your education and employment background.

A2. Response: I have worked as a consulting hydrologist and hydrogeologist in Vermont since 1982. I have a Bachelor of Science degree in Geology and a Master of Science degree in Civil Engineering, both from the University of Vermont. My educational training includes extensive scientific coursework, with a specialization in surface water hydrology and groundwater hydrogeology. My professional background includes the direction, completion, and presentation of technical studies, evaluation and review of scientific data pertaining to water resources, determination of compliance with various state and federal regulatory requirements and application for various permits and authorizations. My specific areas of expertise broadly include water resources evaluation and impact assessment. Some of the more specific areas that I have worked on include stormwater treatment and control; erosion prevention and sediment control planning and design; water supply evaluation; and wetland and stream assessment, impact assessment, restoration and mitigation. I have designed and implemented a large number of projects in Vermont and the northeastern United States involving water resources assessment, planning, impact analysis, permitting and monitoring. My full resume is provided as *Exhibit (Exh.) TDI-JAN-1*.

Q3. Do you hold any professional licenses or certifications?

A3. Response: Yes. I am a Certified Professional in Erosion and Sediment Control ("CPESC") and a Certified Professional in Storm Water Quality ("CPSWQ").

Q4. Have you previously testified before the Vermont Public Service Board?

A4. Response: Yes, I have provided testimony to the Board previously in several different proceedings, including petitions for Certificate of Public Good ("CPG") on behalf of Vermont Gas Systems, Inc. in Docket No. 7970, UPC Vermont Wind, LLC in Docket No. 7156, and provided prefiled testimony on behalf of the Vermont Electric Power Company, Inc. ("VELCO") and Green Mountain Power Corporation ("GMP") in Docket No. 7314 (East Avenue Loop), and GMP, et al. in Docket No. 7628 (Kingdom Community Wind Project).

I have also presented the results of analyses and testified before all nine Vermont District Environmental Commissions, the former Environmental Board, the former Vermont Water Resources Board, the Vermont Environmental Court, and other regional and municipal tribunals.

Q5. On whose behalf are you offering this testimony?

A5. Response: I am offering this testimony on behalf of the Petitioner, Champlain VT, LLC, d/b/a TDI New England ("TDI-NE").

Q6. What is your connection to the Petitioner TDI-NE with respect to its proposed New England Clean Power Link Project ("NECPL")?

A6. Response: VHB was engaged by TDI-NE in Fall 2013 to begin planning for various natural resource surveys, assessments, and permitting efforts for NEPCL. We have continued to serve in this role subsequently. I am the overall Project Manager for VHBs efforts for NECPL.

Q7. What is the purpose of your testimony?

A7. Response: The purpose of my testimony is to introduce the natural resources report narrative and appendices, ***Exhs. TDI-JAN-2 through TDI-JAN-6,*** and related impact assessments in connection with the environmental effects of the NECPL relative to its overland segments (as well as the transition zone from aquatic to overland segment), ***Exhs. TDI-JAN-7 through TDI-JAN-11***. My testimony concerns the NECPL's compliance with specific natural resource-related criteria under 30 V.S.A. § 248(b)(5), including water purity and water pollution, headwaters, floodways, streams, shorelines, wetlands, water conservation, sufficiency of water, burden on existing supply, soil erosion, and waste disposal, with due consideration given to the criteria specified in 10 V.S.A. §§ 1424a(d) and 6086(a)(1) through (8) and (9)(K). I also provide testimony regarding 30 V.S.A. § 248(b)(8), Outstanding Resource Waters.

Q8. Please describe the scope of investigations you performed concerning the NECPL.

A8. Response: In connection with our assessment of the natural resource-related criteria of 30 V.S.A. § 248(b)(5),VHB initially participated in consultation meetings with state and federal

regulatory agency personnel, beginning in early 2014, to present the Project concept and discuss the scope of necessary natural resource investigations in anticipation of the Section 248 petition as well as collateral permit applications. We also prepared initial mapping of areas along the potential Project routing to depict known resource information based on past studies, and publically available Geographic Information Systems ("GIS") databases. We reviewed field study protocols with numerous personnel from the Vermont Agency of Natural Resources ("ANR"). Then, during summer 2014, we performed on-site field investigations to assess natural resource features within the overland portions of the proposed NECPL as described in the testimony and exhibits of Jessome/Martin/Bagnato and Alan Wironen, which I reference as the "terrestrial alignment." The investigation areas for this work included the following Project elements:

- Proposed DC cable alignment from US/Canadian border, along Lake Road and TDI-NE property to the Lake Champlain entry point in Alburgh, VT;
- Proposed DC cable alignment from Lake Champlain exit point, along TDI-NE property and town roads in Benson, VT, to VT Route 22A;
- Proposed DC cable alignment along VT Route 22A, US Route 4, US Route 7, VT Route 103, a segment of the Green Mountain Rail Corp. ("GMRC") Railroad, and VT Route 100 in the towns of Benson, West Haven, Fair Haven, Castleton, Ira, West Rutland, Rutland, Clarendon, Shrewsbury, Wallingford, Mount Holly and Ludlow, VT;
- Proposed DC cable alignment along town roads in Ludlow, VT;
- Proposed Converter Station on TDI-NE property in Ludlow, VT;

- Proposed AC cable alignment from Converter Station to VELCO Coolidge substation in Cavendish, VT; and
- Various laydown and temporary work space areas.

For these Project components, VHB performed detailed natural resource assessments during the 2014 growing season, including investigation of corridor widths of up to 400 feet along the proposed terrestrial cable alignment, resulting in an approximately 1200-acres of area directly studied. The Project area is comprised generally of a corridor 50 feet wide, with a resultant area of approximately 350 acres. These areas are further described in the Natural Resources Report (***Exh. TDI-JAN-2***) and shown on the Natural Resources Map Series (***Exh. TDI-JAN-3***) which depicts the study areas and results.

Q9. What types of field investigations were completed?

A9. Response: The field investigation included the following components:

- Wetlands
- Streams and Rivers
- Riparian buffers
- Shorelines
- Potential vernal pools
- Existing infrastructure intersecting waters (e.g. culverts/bridges)
- Flood prone areas
- Natural communities
- RTE species/habitat (plant and animal)
- Wildlife habitat

These surveys were performed either using standard and accepted protocols, or in the case of RTE and natural community surveys, following study protocols submitted to and reviewed/approved by ANR, as described in the testimony of Galen Guerrero-Murphy.

Q10. Has the entire terrestrial route of the proposed NECPL been investigated for natural resources?

A10. Response: Yes. Since the NECPL will be located entirely within existing public rights-of-way or on private lands owned or controlled by TDI-NE, field investigations for natural resources have been completed along the entire cable alignment and Converter Station site. Some minimal off-ROW investigation has been performed, with landowner permission, where Project-related activities may necessitate access to such lands. Additionally, it is possible that some minor further areas of field investigation may be needed for temporary storage areas or temporary work areas for planned Horizontal Directional Drill ("HDD") or Jack and Bore locations; such locations would be determined as Project design becomes further advanced, with further natural resource investigations to be performed at appropriate seasonal times if needed.

Q11. Have you relied on the work of any other experts concerning the NECPL?

A11. Response: Yes. VHB has enlisted the assistance of TRC Environmental to perform certain tasks, including portions of the natural resource investigations. In addition, Arrowwood Environmental has performed field investigations related to rare, threatened and endangered ("RTE") species, necessary wildlife habitat, and significant natural communities. Finally, Gilman & Briggs Environmental has assisted with RTE related investigation in certain areas

of the Project corridor. This work is presented generally in the testimony of Galen Guerrero-Murphy, and ***Exhs. TDI-GGM-2 through TDI-GGM-7.***

Q12. Have you provided Project information to other experts in support of their section 248 testimony and if so, what?

A12. Response: Yes. The results of our natural resources investigations have been provided to Mr. Alan Wironen, PE of TRC Engineering, for his use in performing the Project's engineering design. In addition, our results have been provided to Mr. Mike Buscher of TJ Boyle Associates, for his use in completing aesthetic assessments.

Q13. What is the nature of the landscape that the terrestrial portion of the NECPL will pass through? Please describe.

A13. Response: From north to south, the NECPL's terrestrial alignment traverses through portions of one town in Grand Isle County Vermont, before transitioning to the Lake segment, and through thirteen towns in Rutland and Windsor Counties. These Project components are located in the Champlain Valley, Taconic Mountains, Vermont Valley and Southern Green Mountains biophysical regions of the state.

The Project terrestrial alignment would be installed within existing town and/or state roadways/railroads or their associated rights-of-way ("ROW"). From a natural resources perspective, these areas have been previously impacted due to road/railroad construction and ongoing operational management activities by other entities such as VTrans, GMCR Railroad, and town road departments.

Q14. Please describe the design criteria which have been used to avoid and minimize potential natural resource impacts that could be caused by construction and operation of the NECPL.

A14. Response: TDI-NE has utilized the following approaches in designing the NECPL to avoid and minimize natural resource impacts:

- Use of HDD to transition between the in-lake cable segment and terrestrial segment to entirely avoid impacts to the Lake Champlain shoreline and riparian buffer, including existing vegetation and soils.
- Selection of lake entry/exit points on relatively flat parcels of land that are currently cleared and developed, in order to reduce the need for tree removal, vegetation clearing and soil disturbance.
- Location of the cable alignment beneath the roadbed surface of unpaved roads within the Towns of Alburgh, Benson and Ludlow to avoid tree clearing, and disturbance of natural resource features.
- Location of the cable alignment within the managed state highways and railroad ROWs to reduce or avoid tree clearing and disturbance of natural resource features.
- Use of HDD to construct the Project beneath Lake Bomoseen, Otter Creek, and other perennial streams where feasible, in order to avoid construction activities within the bodies of water.
- Extensive coordination with VTrans and ANR during the Project design to ensure that where the Project alignment crosses existing culverted streams, the NECPL does not interfere with future potential culvert replacement or stream enhancement opportunities.

- Development of a Project specific Erosion Prevention and Sediment Control ("EPSC") plan to ensure proper management of construction-phase stormwater runoff.
- Development of an operational-phase vegetation management plan and non-native invasive species management plan to avoid vegetative impacts.
- Development of an operational-phase stormwater management concept for the Converter Station site to ensure proper management of stormwater runoff volumes and water quality treatment.

Q15. Given the design of the NECPL, will its construction and operation have an undue adverse effect on natural resources or the natural environment?

A15. Response: No, it will not, as I describe in further detail below.

30 V.S.A. § 248(b)(8) – Natural Resource Criteria

10 V.S.A. § 1424a(d) and 30 V.S.A. § 248(b)(8) – Outstanding Resource Waters

Q16. Based upon your evaluation and analyses, will the NECPL have any impacts on Outstanding Resource Waters?

A16. Response: No. Section 1-03(D) of the Vermont Water Quality Standards ("VWQS") (effective October 30, 2014) provides that the Secretary of ANR may, under 10 V.S.A. § 1424a, designate Outstanding Resource Waters. A list of these waters is maintained on the ANR website. The following waterways have been classified as Outstanding Resource Waters:

1. Batten Kill River, Towns of East Dorset and Arlington;

2. Pike's Falls/Ball Mountain, Town of Jamaica;
3. Poultney River, Towns of Poultney and Fair Haven; and
4. Great Falls, Ompompanoosuc River, Town of Thetford.

None of the Project lands are within the vicinity of watersheds of these waters, and therefore the NECPL will have no impact on Outstanding Resource Waters. *See Exh. TDI-JAN-2, §4.*

10 V.S.A. § 6086(a)(1) – Water Purity and Water Pollution

Q17. Will the Project have an undue adverse effect upon water purity or cause undue water pollution?

A17. Response: No. Please see my responses below which address the specific water-related criteria of Act 250, namely Criteria 1(A), 1(B), 1(D), 1(E), 1(F), 1(G), and 4. My responses also describe the data collection, assessment and impact evaluation methods that have been used for the NECPL. See also the testimony of Galen Guerrero-Murphy which addresses natural communities, wildlife habitat, and RTE species.

10 V.S.A. § 6086(a)(1)(A) – Headwaters

Q18. Is the NECPL being developed near any headwaters?

A18. Response: Yes. VHB/TRC completed water resource field studies and analyzed available information including topographic maps, and state-mapped public water supply source protection areas to determine if the NECPL is located on lands that meet the criteria of V.S.A. § 6086(a)(1)(A), which include:

i. Headwaters or watersheds characterized by steep slopes and shallow soils; or

ii. Drainage areas of 20 square miles or less; or

iii. Above 1,500 feet elevation; or

iv. Watersheds of public water supplies designated by the ANR; or

v. Areas supplying significant amounts of recharge water to aquifers.

Within portions of the NECPL Study Areas there are discrete areas of steep slopes (typically those greater than 15 percent) with shallow soils, and the drainage areas of several of the Vermont-mapped and delineated water features are less than 20 square miles. The cable alignment is located above 1,500 feet elevation in the Towns of Mount Holly and Ludlow, ranging from 1500 to 1600 feet asl. ***See Exh. TDI-JAN-2, §5.***

Because portions of the Project area meets one or more of the headwaters criteria, development of the NECPL within these headwater areas would be required to conform to applicable regulations to protect water quality pursuant to the Vermont Water Quality Standards ("VWQS"). In particular, discharges of stormwater runoff from NECPL construction activities would be regulated under the National Pollutant Discharge Elimination System ("NPDES") Construction Stormwater Discharge program, which is administered by the Vermont Department of Environmental Conservation ("VT DEC"), and requires the implementation of Best Management Practices ("BMPs") to protect water quality. ***See Exh. TDI-JAN-7.*** I describe the proposed approach to construction-phase stormwater management further below, under criterion 4.

An operational-phase stormwater discharge permit will be required for the Converter Station, as the proposed amount of impervious surface exceeds the one acre threshold for the VT DEC operational-phase stormwater program. I describe the proposed approach to operational-phase stormwater management further below, under criterion 1B.

Q19. Will the NECPL have an undue adverse impact to headwaters?

A19. Response: No. With incorporation of construction-phase BMPs, and adherence to the EPSC approach described further in association with Criterion 4, the NECPL will meet the applicable VT DEC regulations regarding any reduction of the quality of ground or surface waters in all areas of construction, including headwaters areas. *See Exhs. TDI-JAN-7, 8, and 10.*

10 V.S.A. § 6086(a)(1)(B) – Waste Disposal

Q20. Please describe how waste disposal will be addressed for the NECPL.

A20. Response: The Act 250 Waste Disposal criterion incorporated into Section 248 review provides that a project must meet applicable health and environmental conservation department regulations regarding the disposal of waste, and must not involve the injection of waste materials into groundwater or wells.

Consideration of wastewater disposal under this criterion involves both sanitary wastewater and stormwater runoff. With respect to sanitary wastewater, during construction of the Project, portable toilets serviced by a licensed septic hauler will be used on the site. Once the Project is operational, no sanitary facilities will be required as the Converter Station will not have permanent staffing on-site. TDI-NE owns a house with existing wastewater facilities adjacent to the Converter Station.

As briefly described above, the NECPL will result in the creation of more than one acre of new, expanded, or redeveloped impervious surface, at the Converter Station in Ludlow. Therefore, pursuant to the Vermont Environmental Protection Rules, Chapter 18,

Stormwater Management Rule (VT ANR, DEC 2011), permit coverage is required. Coverage under the General Permit for discharges of regulated stormwater runoff from new development, redevelopment, and/or expansion of existing development that results in at least one (1) acre of impervious surface to waters of the State. As noted above, the majority of the NECPL involves the temporary earth disturbance for the installation of underground infrastructure with restoration of the ground surface to pre-construction contours and vegetated conditions. Thus, most of the Project activities do not result in the creation of any new impervious surfaces. Permanent impervious surfaces that will be constructed by the Project are limited to the Converter Station site. These proposed areas, associated runoff characteristics, and proposed stormwater management approach are described in detail in *Exh. TDI-JAN-7*.

Given that the total amount of impervious surface triggers the need for an operational-phase stormwater discharge permit at the Converter Station, permanent stormwater treatment systems are to be included as part of the overall Project design. Given the site characteristics, including slope and parcel area, I am confident that an operational phase stormwater management system will be designed using acceptable stormwater treatment practices, to conform with the VT Stormwater Management Manual and therefore qualify for coverage under VT DEC General Permit 3-9015 for operational phase stormwater discharges. In addition, the proposed design minimizes the construction of new impervious surfaces, protects natural drainage patterns, and maximizes infiltration of stormwater in order to protect water quality of receiving waters, consistent with Vermont water quality policy.

Q21. Will the NECPL meet all applicable state regulations with respect to waste disposal?

A21. Response: Yes. For the reasons stated above, the NECPL will meet applicable health and environmental conservation department regulations regarding the disposal of waste and does not involve the injection of waste materials into groundwater or wells.

10 V.S.A. § 6086(a)(1)(C) – Water Conservation

Q22. Will the Project's design meet all applicable state regulations with respect to water conservation?

A22. Response: Yes. This criterion requires that a project's design incorporate water conservation principles. The NECPL will involve temporary and very limited water usage. During construction of the overland portion, small amounts of water usage may be necessary for dust suppression, in accordance with the EPSC Plan, and incidental washing of equipment, which can be provided by existing sources or commercial water haulers. Once operational, there will be no ongoing water use associated with the NECPL. Considering the limited and temporary water usage needed, the NECPL will ensure that reasonable efforts have been made to conserve water.

10 V.S.A. § 6086(a)(1)(D) – Floodways

Q23. Has the potential impact on lands described as floodways been investigated?

A23. Response: Yes. This criterion takes into consideration a project's effect on both floodways and floodway fringes. The term "floodway" is defined to mean "the channel of a watercourse which is expected to flood on an average of at least once every 100 years and the adjacent land areas which are required to carry and discharge the flood of the

watercourse." (10 V.S.A. § 6001(6)). The term "floodway fringe" is defined as "an area which is outside a floodway and is flooded with an average frequency of once or more in each 100 years" (Id. § 6001(7)), and is generally synonymous with a 100-year floodplain.

A project's impacts can be considered with respect to both flood inundation and fluvial erosion hazard ("FEH"), when applicable (ANR 2009). The FEH area or river corridor is the lateral width of a stream corridor that may be subject to fluvial erosion from stream channel lateral migration over time. The FEH, when applicable, is determined by geomorphic assessments of channel bank full width, meander centerline, confining lateral topography, channel type, and current channel adjustments. The resultant FEH is typically defined by a channel-width to belt-width ratio, which is dependent on stream sensitivity type and adjacent landform (ANR 2009).

The available Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Maps were reviewed and the locations of FEMA-mapped floodways within the Project area were determined. These locations are depicted on the NECPL Natural Resource Map Series (***see Exh. TDI-JAN-3***). The floodway maps indicate that there are 25 floodway or floodway fringe (floodplain) areas that occur within the NECPL's proposed alignment.

To address the second consideration, River Corridors within which fluvial erosion hazard ("FEH") zones are present have been identified by VT DEC for certain streams and rivers. VT DEC provided FEH corridor data for 28 locations where the proposed alignment would cross or run parallel to a stream with a watershed greater than 0.5 square miles, which are also shown on the Project maps as River Corridors. ***See Exh. TDI-JAN-3.***

Q24. Will the Project have an undue adverse impact on lands described as floodways?

A24. Response: No. Temporary construction impacts to these areas have been avoided through the use of HDD where feasible under perennial streams and rivers, thereby avoiding disturbance of the bed and banks of these water bodies. Additionally, there will be no permanent alterations to waterways, flood elevations, or the ability of the land to hold water, because the ground contours will be restored and disturbed areas revegetated following construction, as described in Mr. Wironen's testimony.

The Converter Station is located outside of FEMA Zone A designated areas and, thus, this facility will not impact floodways or floodway fringes. With respect to FEH corridors, at all locations where the Project alignment crosses such areas, existing infrastructure (e.g. roadways, railroads) are present which would preclude the natural lateral migration of the subject streams/rivers over time. Therefore the NECPL would not result in any changes to future VT DEC river management actions in such areas, and accordingly not result in FEH related impacts.

Based upon the measures included in Project design and construction, the NECPL will not permanently restrict or divert the flow of flood waters, or endanger the health, safety and welfare of the public or of riparian owners during flooding; and the necessary construction work within a floodway fringe will not increase the peak discharge of the river or stream within or downstream of the Project area or endanger the health, safety, or welfare of the public or riparian owners during flooding.

10 V.S.A. § 6086(a)(1)(E) – Streams

Q25. Please describe the methods employed by VHB to evaluate streams for the NECPL.

A25. Response: This criterion requires that projects will, when feasible, maintain the natural condition of streams, and will not endanger the health safety, or welfare of the public or adjoining landowners. VHB/TRC environmental scientists conducted field delineation and assessment of stream features during the period May 2014 to November 2014. ***See Exh. TDI-JAN-2, § 7.*** Streams are identified according to federal delineation procedures (USACE 2005), including flow regime designation and ordinary high water ("OHW") width. During field work, flow regimes are preliminarily classified as perennial, intermittent or ephemeral and are determined based on qualitative observations of instream hydrology indicators at the time of observation and existing geomorphic characteristics. The limits of open waters, such as those associated with Lake Champlain and Lake Bomoseen, are delineated along the field-determined ordinary high water levels.

The major water courses within the Study Area include the Hubbardton River, Mud Brook, North Brenton Brook, Castleton River, Clarendon River, Otter Creek, Cold River, Mill River, Freeman Brook, Branch Brook, Coleman Brook, and Black River. Representative stream photographs within the proposed NECPL corridor are presented in ***Exh. TDI-JAN-6a***. Streams within the Study Area were assessed to determine watershed sizes in the context of potential review by the VT DEC Rivers Management Program under the Vermont Stream Alteration Permit program (WMD 2014). As part of this review, the existing VWQS classifications of the streams throughout the NECPL alignment were evaluated. All delineated streams and rivers are Vermont Class B waters, as designated by the 2014 VWQS. A summary of streams identified is provided as ***Exh. TDI-JAN-5***.

Riparian buffers adjacent to streams and rivers, consistent with the ANR Buffer Guidance, have been designated for perennial and intermittent streams within the Study Area. Fifty-foot buffers from the field mapped stream center or top of bank/top of slope, as appropriate, are used (see the NECPL Natural Resource Maps, ***Exh. TDI-JAN-3***).

Project impacts to federally jurisdictional waters, including streams, will require a USACE Section 404 Individual Permit as well as a Vermont Section 401 Water Quality Certification. A Stream Alteration Permit will also be required from the VT DEC River Management Program for impacts to jurisdictional streams. ***See Exh. TDI-JAN-8*** for an evaluation of impacts to streams regulated under the Stream Alteration program.

The VT DEC Rivers Management Program has reviewed mapping for the NECPL and discussed Project components as they relate to the Stream Alteration Permit review. The USACE and ANR have field reviewed stream delineations on July 10, 2014 and August 27, 2014.

Q26. Please describe the measures that have been incorporated into the Project design to avoid or minimize impacts to streams.

A26. Response: The Project design has carefully considered protection of streams. This began with the delineation of all streams within the NECPL corridor, including mapping of riparian buffers. The design then sought to implement construction practices that would avoid and minimize impacts through specific design criteria, as described in the testimony of Alan Wironen, and as depicted in the *Project Plans – Overland Route* and the *Typical Construction Methods and Designs – Overland Route* (***Exhs. TDI-AW-2 and AW-3***). Specific to streams, the following avoidance and minimization measures have been implemented:

- Complete avoidance of any permanent stream channel impacts;
- Minimization of the number of buried crossings of streams;
- Co-location of the Project with existing culverted crossings of streams to avoid new temporary stream channel impacts;
- Providing stream dewatering/bypass structures to complete open trench excavations in a dry bed;
- Identification of riparian buffers in accordance with the ANR Buffer Guidance;
- Use of HDD where feasible to avoid direct impacts to stream channels;
- Implementation of stringent EPSC measures to protect water quality during construction;
- Implementation of prompt restoration and revegetation at all stream crossings; and
- Development of a specific long-term vegetation management protocol for implementation within riparian buffer areas that will be crossed by the Project.

In addition, the Project may provide opportunities for improvement to certain existing culverted stream crossings during construction, subject to review and approval by involved agencies.

Q27. Will the NECPL be located on or adjacent to streams? Please explain.

A27. Response: Yes. As I have described above, the Project will be located on or adjacent to streams, as it is not possible to meet the overall project purpose without crossing streams along the proposed cable alignment. Based on the field investigations performed, the proposed Project alignment would cross 51 perennial streams, 78 intermittent streams, and

38 ephemeral streams. These crossing locations and the characteristics of each are listed in *Exh. TDI-JAN-9b*. Eleven named streams would be crossed by the proposed Project alignment, namely the Hubbardton River, Mud Brook, North Brenton Brook, Castleton River, Clarendon River, Otter Creek, Cold River, Freeman Brook, Branch Brook (crossed twice), Coleman Brook, and Black River. The Project would also cross an additional 39 unnamed tributaries that were identified and delineated in the field as perennial streams. A summary of the proposed perennial stream crossings is as follows:

- 10 of the stream crossings are located at sites with contributing drainage areas greater than 10 square miles.
- 10 of the stream crossings are located at sites with contributing drainage areas between 1 and 10 square miles.
- 8 of the stream crossings are located at sites with contributing drainage areas between 0.5 and 1 square miles.
- 23 of the stream crossings are located at sites with contributing drainage areas less than 0.5 square mile.

Of the perennial stream crossings, construction at 43 of the 51 crossings, including all of the larger named features would occur in a manner that would avoid disturbance of the bed or banks of the streams. This would be accomplished through installation beneath or above existing culverts, use of HDD, or attachment of the cables to bridge structures. For the remaining crossings, open trench excavation would be used with proper EPSC practices in place, such as streamflow diversion. The crossing type at each perennial stream crossing is depicted on the Stream Alteration Review Index Map; see *Exh. TDI-JAN-9a.*

Q28. Will the NECPL ensure that the natural conditions of the streams be maintained where feasible? Please explain.

A28. Response: Yes. The Project alignment was selected and the Project has been designed to minimize impacts to streams and rivers, primarily by proposing to construct the transmission cable within existing road and railroad ROWs. This approach avoids placing new infrastructure within otherwise unconstrained River Corridors and minimizes the amount of in-stream work by installing crossings at the locations of existing culverts and bridges. Given this design approach as well as the impact avoidance and minimization measures described above, the construction and operation of NECPL will maintain the natural condition of streams within the Project alignment.

Q29. Since the NECPL will be located on or adjacent to streams, will the health, safety, or welfare of the public or adjoining landowners be endangered? Please explain.

A29. Response: No. Given that the Project is located within existing road and railroad ROWs, generally in the immediate vicinity of existing culverted crossings, the Project will result in post-construction conditions that do not differ from what exists today, except where agreed upon improvements to existing stream crossing infrastructure are made to address deficient or deteriorated culverts. During construction, appropriate EPSC measures, as described below with respect to Criterion 4, will be employed to protect streams and ensure that the health, safety or welfare of the public or adjoining landowners is not endangered.

Q30. Will the Project require a Stream Alteration Permit from VT DEC?

A30. Response: Yes. Generally, streams with a contributing drainage area of greater than 0.5 square miles are subject to review and permit approval under the Vermont Stream Alteration program. TDI-NE has begun consultation with ANR personnel in anticipation of preparation of a permit application. Due to the scope and extent of the work, TDI-NE anticipates seeking coverage under the Individual Permit category of the Vermont Stream Alteration General Permit. However, it is my expectation that the Project will qualify for issuance of this permit, as the design has been performed in a manner that conforms with the applicable permitting criteria.

Q31. Please summarize your conclusions with respect to the NECPL's potential impacts to streams.

A31. Response: The design and implementation measures described above will protect the natural condition of streams, and will not result in endangerment to the health, safety, or welfare of adjoining or downstream landowners from stream channel impacts. In addition, TDI-NE will obtain Section 404/401 permits and a stream alteration permit for the Project prior to doing work in these areas.

10 V.S.A. § 6086(a)(1)(F) – Shorelines

Q32. Please describe the methods employed to evaluate shorelines in the context of the NECPL.

A32. Response: Shorelines are defined as the land adjacent to the waters of lakes, ponds, reservoirs, and rivers. Shorelines include the land between the mean high water mark and

the low water mark of such waters. For projects that are within shoreline areas, the following shoreline management criteria are required to be met:

(i) retain the shoreline and the waters in their natural condition;

(ii) allow continued access to the waters and the recreational opportunities provided by the waters;

(iii) retain or provide vegetation which will screen the development or subdivision from the waters; and

(iv) stabilize the bank from erosion as necessary with vegetation cover.

The open water bodies that meet this criterion within the Project area are Lake Bomoseen and Lake Champlain. Additionally, shorelines are associated with the following rivers that are intersected or parallel to the NECPL's alignment: Hubbardton River, Castleton River, Clarendon River, Otter Creek, Cold River, Mill River, and Black River.

For the underwater cable portion of the NECPL in Lake Champlain, a Vermont DEC Lake Encroachment Permit will be required. For the overland component of the NECPL, the crossing of Lake Bomoseen will also likely require this permit from the VT DEC Watershed Management Division.

Projects under Section 248 review are exempt from needing the newly adopted Vermont Shoreland Permit, which regulates activities within 250 feet of the mean water level of lakes greater than 10-acres in size. Nonetheless, we address the substantive standards of the Vermont Shoreland Permit Program below. *See also Exh. TDI-JAN-2, § 8.*

Q33. Will the natural condition of the shorelines be maintained where feasible? Please explain.

A33. Response: Yes. This criterion requires that the Project "must of necessity be located on a shoreline in order to fulfill the purpose of the [project], and . . . will, insofar as possible and reasonable in light of its purpose," retain all shorelines and waters in their natural condition; allow continued access to the waters and the recreational opportunities provided by the waters; retain or provide vegetation which will screen the Project from the waters; and stabilize the bank from erosion, as necessary, with vegetation cover. With respect to the proposed NECPL alignment at Lake Champlain, the start of the HDD in Alburgh will be greater than 200 feet from the Ordinary High Water mark of Lake Champlain, and no clearing will be required within the 100 foot riparian buffer zone adjacent to the Lake. At the termination of the Lake segment in Benson, the HDD exit point is located approximately 400 feet from the shoreline, and again no clearing will be required within the 100 foot riparian buffer zone adjacent to the Lake. For the Lake Bomoseen crossing, the HDD entry and exit points will be at least 200 feet from the lakeshore on either side, again not requiring any vegetation removal within the shoreline area or 100 foot riparian buffer. A Lake Encroachment Permit will be required from VT DEC for these proposed lake crossings.

With respect to the shorelines associated with river crossings, as listed above, in all instances, the Project will cross these features in a manner that does not disturb the shoreline or existing vegetation associated with the shoreline area. This will be achieved through the use of HDD, except for the crossing of the Black River in Ludlow, where the cables will be attached to an existing town bridge structure.

Q34. Since the Project will be located on or adjacent to shorelines, will the health, safety, or welfare of the public or adjoining landowners be endangered? Please explain.

A34. Response: No. As described above the Project will not result in disturbance or alteration of the shorelines of waterbodies that will be crossed by the proposed cable alignment. During construction, appropriate EPSC measures, as described below with respect to Criterion 4, will be employed to protect areas adjacent to shorelines, and ensure that the health, safety or welfare of the public or adjoining landowners is not endangered.

Q35. Please describe the measures that have been incorporated into the Project design to avoid or minimize impacts to shorelines.

A35. Response: The Project design includes careful considered protection of shorelines. This began with the identification of all shorelines within the Project corridor, including mapping of associated riparian buffers. The Project Plans for the Overland Route (*Exh. TDI-AW-2)* then sought to incorporate construction practices that would avoid and minimize impacts through the following:

- Complete avoidance of any permanent river channel/bank impacts;
- Minimization of the number of buried crossings of shorelines;
- Proposed use of HDD to completely avoid impacts on the Lake Champlain and Lake Bomoseen shorelines at the entry and exit points,
- Proposed use of HDD/bridge attachment to avoid direct impacts on other shorelines of rivers along the Project alignment;

- Identification of stringent EPSC measures to be implemented to protect water quality during construction;
- Establishment of a requirement for prompt restoration and revegetation at all shoreline areas; and
- Development of a specific long-term vegetation management protocol for implementation within riparian buffer areas that will be crossed by the Project.

Q36. Please summarize your conclusions concerning shorelines in the context of the NECPL.

A36. Response: In order to meet the NECPL's overall purpose and design, i.e., a completely underwater and underground HVDC transmission line from the Canadian border to the VELCO Coolidge Substation in Cavendish, the alignment must of necessity cross several shoreline areas. However, the NECPL has been designed in a manner that will maintain the natural condition of these shorelines, allow continued access, and retain existing vegetation.

10 V.S.A. § 6086(a)(1)(G) – Wetlands

Q37. Please summarize the investigations that you conducted regarding wetlands.

A37. Response: VHB/TRC field staff conducted wetland delineation work within the direct Study Area including the proposed Project alignment and known temporary work zones, from May to November 2014. The results of our wetland investigations are described in detail in the Natural Resources Report (*see Exh. TDI-JAN-2, §9*) and shown on the Natural Resources Map Series (*see Exh. TDI-JAN-3*). A tabular listing of all wetlands

identified along the terrestrial route is provided as ***Exh. TDI-JAN-4***. Photographs of typical wetlands found along the proposed overland alignment are provided as ***Exh. TDI-JAN-6b.***

Q38. Please describe the process that was used for identifying and mapping wetlands.

A38. Response: Wetland delineations were made pursuant to the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region Routine Determination Method. The field study included assessment of proposed wetland classifications under the 2010 Vermont Wetland Rules ("VWR"), general characteristics, identified functions and values of the wetland, any unique characteristics observed during the site assessment, along with other considerations relevant to support site findings. Wetlands were also classified in accordance with the Classification of Wetlands and Deepwater Habitats of the United States (Cowardin, et al. 1979). Wetland functions criteria were qualitatively evaluated based on the field notes and observations according to the VWR Section 5 (*Functional Criteria for Evaluating a Wetland's Significance*) (NRB 2010).

In conducting the field investigations along the terrestrial alignment, two distinct areas were defined. The "Study Area" was comprised generally of the lands within the roadway/railroad ROWs within which Project activities (during both the construction and operational phases) will occur. In addition, a supplemental area generally 50-feet wide outside of the road or railroad ROW areas was added in order to approximate the boundaries of potential wetlands and/or wetland buffers; this area is referred to as the "Approximate Study Area". The intent of adding this supplemental area is to provide information on additional wetlands in the context of the Project corridor, as well as to identify potential buffer zones of nearby wetlands that could extend into the Project

corridor. The limits of both the Study Area and Approximate Study Area are indicated on the Natural Resource Maps (***see Exh. TDI-JAN-3***). The extent of potential natural resource feature within the Approximate Study Area have been identified based on a combination of information gathering from reconnaissance-level observation from within the direct Study Area, along with mapping from off-site resource review/interpretation (including aerial photography, available topography, soil survey maps, VSWI-mapping, previous delineations etc.), in order to conservatively assess the maximum likely extent of any wetland features and potential buffer zones. Field investigation/delineation has not been performed within the Approximate Study Area.

Q39. Please briefly summarize your findings with respect to the size and characteristics of the wetlands in the vicinity of the Project.

A39. Response: A total of 508 features were identified within the Study Area or Approximate Study Area. The wetland investigation and delineation included assessments for the presence of all Class I, Class II and Class III wetlands within the study areas. There are no Class I Wetlands present within the study areas. As part of the field studies, all wetland features were delineated within the Study Area, several of which are not distinct wetlands, but rather segments of larger on or off-Study Area wetland complexes (see the Natural Resource maps, ***Exh. TDI-JAN-3*** and Representative Wetland Photographs, ***Exh. TDI-JAN-6b***). The Summary of Delineated Wetlands table provided as ***Exh. TDI-JAN-4*** details wetland characteristics relative to the criteria for classifying significant wetlands under the 2010 VWR, as well as other summary data including:

- VHB Wetland ID

- Town
- Habitat classification (per Cowardin, et.al. 1979)
- Contiguous to mapped VSWI (Yes/no)
- Delineation Area (Square Feet)
- VHB Proposed VWR Classification

In May 2014, VHB/TRC Environmental Scientists also conducted a survey for vernal pool sites according to the definitions of vernal pools provided by the USACE (2007) and Thompson and Sorenson (2005). Through this survey there were no areas identified that would meet vernal pool criteria within the designated Study Area. ***See Exh. TDI-JAN-3, §9.*** This is further corroborated by field surveys for Special Aquatic Sites performed by Arrowwood Environmental in summer 2014. ***See Exh. TDI-GGM-3.***

Q40. Have you identified any wetlands at or near the Project route—including the Ludlow Converter Station—that are protected by the Vermont Wetland Rules?

A40. Response: Yes. There are numerous wetlands along the Project alignment which are shown on VSWI mapping, and are therefore regulated under the Vermont Wetland Rules ("VWR"). In addition, based on a review of the data associated with each wetland there are several wetlands that are proposed as meeting one or more of the VWR Section 4.6 presumptions of significance. As such, these wetlands would potentially be considered Class II. These wetlands are shown on the Natural Resources Maps (***Exh. TDI-JAN-3***) and a summary of the presumptions associated with each wetland is summarized in ***Exh. TDI-JAN-4***. The Vermont DEC wetlands program field-reviewed the proposed VHB/TRC wetland

classifications on July 10 and August 27, 2014, and the USACE reviewed the wetland boundaries concurrently.

In brief summary, proposed Class II wetlands within the area studied are found to meet one or more of the VWR functions:

- 5.1 Water Storage for Flood Water and Storm Runoff
- 5.2 Surface and Ground Water Protection
- 5.4 Wildlife Habitat
- 5.5 Exemplary Wetland Natural Community
- 5.6 Rare Threatened and Endangered Species Habitat
- 5.7 Education and Research in Natural Sciences
- 5.8 Recreational Value and Economic Benefits
- 5.9 Open Space and Aesthetics
- 5.10 Erosion Control through Binding and Stabilizing the Soil

It is noteworthy that many of the wetlands and buffers mapped within the Project vicinity are colonized by non-native invasive species ("NNIS"), as they are located within previously disturbed areas associated with features such as roadside drainage swales. These invasive species most often include, but are not limited to: common reed (Phragmites australis), purple loosestrife (Lythrum salicaria), buckthorn (Rhamnus spp.), and various honeysuckles (Lonicera spp.), as well as the aggressive reed canary grass (Phalaris arundinacea). As a result, these wetlands would generally be considered to be of lower quality than features without such NNIS presence. A general survey for NNIS has been completed for the Project and is provided as ***Exh. TDI-GGM-7***.

Q41. How are Class III wetlands being addressed?

A41. Response: As noted above, all wetlands regardless of potential VWR classification have been mapped within the Study Area. However, Class III wetland impacts are not regulated by the VWR or considered under Act 250 Criterion 1(G), but are generally reviewed under Section 248(b) in the context of the assessment for no undue adverse impacts on the natural environment, and are regulated by the USACE Section 404 permit program as well as the related VT DEC Section 401 Water Quality Certification review process. The dredging of, or placement of fill in any wetland (or water) under USACE jurisdiction requires permit coverage from the USACE under Clean Water Act Section 404.

For proposed impacts to all wetlands, including Class III wetlands, TDI-NE will be required to apply for a Department of the Army Section 404 Permit and Section 401 Water Quality Certification prior to undertaking Project activities with permanent or temporary wetland impacts resulting from regulated impacts that are unavoidable from the NECPL.

Q42. Please describe the measures that have been incorporated into the NECPL's design to avoid or minimize impacts to wetlands.

A42. Response: As with streams and shorelines, the Project design has carefully considered protection of wetlands and buffers. This began with the delineation of all wetlands/buffers within the Project corridor, as described above. The design then sought to include construction practices that would avoid and minimize impacts through specific design criteria, as described in the testimony of Alan Wironen, and as depicted in the Project Plans and Construction Typicals (Overland Route) (*Exhs. TDI-AW-2 and AW-3*). Specific to

wetlands, the following avoidance and minimization measures have been incorporated into the Project Plans and Construction Typicals (Overland Route).

- Complete avoidance of any permanent wetland fill impacts;
- Locating the NECPL within existing disturbed/managed rights-of-way to minimize impacts to previously undisturbed wetlands;
- Identifying and avoiding impacts to riparian buffers in accordance with the ANR Buffer Guidance and VWR;
- Implementing stringent EPSC measures to protect water quality during construction as will be specified in final EPSC plans;
- Implementing topsoil segregation procedures during construction to ensure rapid revegetation of areas of temporary wetland impact;
- Implementing prompt restoration and revegetation at all wetland crossings during construction;
- Stabilizing disturbed soils with seed, including a native wetland seed mix for wetland areas, and providing temporary stabilization in the form of seedless straw; and
- Developing a specific long-term vegetation management protocol for implementation within wetlands and buffer areas that will be crossed by the NECPL.

Q43. Please describe the proposed Class II wetland impacts that will result from the Project.

A43. Response: As presented in ***Exh. TDI-JAN-10***, the NECPL will result in no permanent fill impacts to Class II wetlands for the cable alignment or Converter Station. Temporary impacts to Class II wetlands due to construction phase disturbance have been estimated as follows:

- Project corridor (generally 12 feet wide): 2.68 acres
- Temporary off-road work area (areas outside the Project corridor that will be disturbed during construction): 1.02 acres
- Total: 3.70 acres

Of these, 1.70 acres are currently forested and 2.0 acres are non-forested (e.g meadow or shrub-scrub). Ongoing vegetation maintenance would occur within the Project corridor as necessary, resulting in the permanent conversion of 1.23 acres of forested wetland to non-forested.

Q44. Please describe the proposed Class II wetland buffer impacts that will result from the Project.

A44. Response: As presented in ***Exh. TDI-JAN-10***, the NECPL will result in no permanent fill impacts to Class II wetland buffers for the cable alignment or Converter Station. Temporary impacts to Class II wetland buffers due to construction phase disturbance have been estimated as follows:

- Project corridor (generally 12 feet wide): 7.29 acres

- Temporary off-road work area (areas outside the Project corridor that will be disturbed during construction): 10.1 acres
- Total: 17.4 acres

Of these, 3.56 acres are currently forested and 13.8 acres are non-forested (e.g meadow or shrub-scrub). Ongoing vegetation maintenance would occur within the Project corridor as necessary, resulting in the permanent conversion of 1.08 acres of forested buffer to non-forested.

Q45. Please describe the proposed impact on all wetlands (Class II and III) that will result from the Project.

A45. Response: As presented in ***Exh. TDI-JAN-10***, the NECPL will result in no permanent fill impacts to any wetlands for the cable alignment or Converter Station. Temporary impacts to all wetlands (Class II and III) due to construction phase disturbance have been estimated as follows:

- Project corridor (generally 12 feet wide): 1.65 acres
- Temporary off-road work area (areas outside the Project corridor that will be disturbed during construction): 3.64 acres
- Total: 5.29 acres

Of these, 2.40 acres are currently forested and 2.89 acres are non-forested (e.g meadow or shrub-scrub). Ongoing vegetation maintenance would occur within the Project corridor as necessary, resulting in the permanent conversion of 0.68 acres of forested buffer to non-forested.

Q46. Have wetlands impacts been avoided, and if so, to what extent?

A46. Response: Yes. Given the Project design criteria and the specific avoidance/minimization measures described above, it is my opinion that impacts to wetlands resulting from the Project have been avoided insofar as practicable.

Q47. Will the Project have any undue adverse effect on significant wetlands?

A47. Response: No. Under this criterion, a proposed project is required to comply with the Vermont Wetland Rules ("VWR"). The VWR regulate significant wetlands (Class I and Class II Wetlands) and their buffers (NRB 2010). There are no Class I wetlands in the vicinity of the Project and therefore none will be impacted. Proposed impacts to Class II wetlands or their associated 50-foot buffer zones for uses other than those allowed under the VWR require a Vermont Wetland Permit from the DEC. Class III wetlands are not regulated by the VWR, but as noted above, are regulated under other permitting mechanisms. As described above, the Project has been sited along existing managed ROWs which results in avoidance of undisturbed wetlands. In addition, various measures are proposed to minimize impacts to those wetland features that will of necessity be crossed by the NECPL alignment.

Therefore, based on the results of our field investigations, Project design criteria, and the evaluation of anticipated temporary and permanent impacts, VHB concludes that the Project will not result in undue adverse effects to wetlands protected under the Vermont Wetland Rules, and would therefore conform with the requirements of the VWR. Additional documentation supporting this conclusion will be provided in the forthcoming wetland permit applications. Issuance of the applicable federal and state wetland impact

permits, which will include a review of alternatives, documentation of impact avoidance/minimization, and if necessary – compensation, will confirm VHB's conclusion that the Project will not have an undue adverse effect on the function of wetlands, significant or otherwise.

10 V.S.A. § 6086(a)(2) and (3) – Sufficiency of Water and Burden on Existing Supply

Q48. Will there be sufficient water available for the reasonably foreseeable needs of the Project?

A48. Response: Yes. The Project will involve temporary and very limited water usage. During construction of the overland portion, small amounts of water usage may be necessary for dust suppression, in accordance with the EPSC Plan, and incidental washing of equipment. Once operational, there will be no ongoing water use associated with the Project.

The construction-phase water needs for dust control and equipment washing will be supplied by Project contractors from approved sources, such as purchasing and hauling bulk water from nearby public community water systems. Ample water is available for this need. *See Exh. TDI-JAN-11a.*

Q49. Will the Project cause a burden to any existing water supply?

A49. Response: The Project is not expected to cause any adverse impacts to existing wells or springs, such as loss of yield or decreased water quality. During construction of the Project, the cables will be placed within a shallow trench that will be typically five feet deep and approximately four feet wide. If ledge is encountered, it will be removed by the most suitable technique, with preference for mechanical removal (i.e. excavating the rock with an

excavator bucket and/or pneumatic hammer), rather than blasting. If mechanical removal is not possible, then TDI-NE will evaluate alternatives, including a more shallow cable installation with enhanced concrete or steel cover protection, an increase in the amount of cover (if the changed topography is not problematic), or blasting, to achieve the standard depth. Blasting, if needed, would be conducted only to the extent necessary to remove rock to allow the cables to be buried. Any blasting that is performed will follow the blasting plan as presented in the overview testimony of Jessome/Martin/Bagnato (***See Exh. TDI-JMB-10)***. This plan is intended to ensure that explosives are properly managed so that off-site blast impacts to existing water supplies will be avoided. As described in the plan, any blasting that is performed would be conducted in a manner that conforms with industry standards and practices, including the use of pre- and post-blast surveys to document existing conditions and potential impacts to wells and structures that are in proximity to blasting areas.

The NECPL will cross through a number of source protection areas ("SPAs") designated by the Water Supply Division of the Vermont Department of Environmental Conservation, for public water supplies, and will pass in the vicinity of other public water supplies. Along the terrestrial portion of the route, these include nine public water systems using groundwater sources that have either designated SPAs or public water sources within the immediate vicinity of the NECPL. These systems are described in ***Exh. TDI-JAN-11a*** and shown on mapping provided as ***Exh. TDI-JAN-11b.*** The NECPL also will pass by various existing private water supplies, including drilled bedrock wells. Relative to the depth of a typical drilled well (generally 200 to 400 feet), the five-foot depth of trenching and potential blasting is very small. Likewise, the width of the trench is only four feet, and thus

minimizes the amount of blasting needed. Furthermore, the NECPL will be located within existing road rights-of-way where earthwork and grading has taken place previously, and thus will reduce the potential for disturbance to natural soils, geology, or groundwater flow.

Based on the fact that construction and blasting for the overland portion of the Project will not alter existing ground topography, will not increase impervious surfaces, will be within existing maintained rights-of-way, is limited in both vertical extent as well as trench width, and given that TDI-NE has prepared a blasting plan that includes pre- and post-blast surveys of nearby water supplies and to remediate damage from blasting should it occur, it is expected that the overland installation of the Project will have no effect on water sources. See *Exh. TDI-JMB-10*.

10 V.S.A. § 6086(a)(4) – Soil Erosion

Q50. Will the Project cause undue soil erosion, or significant drainage or runoff problems?

A50. Response: No. As I describe in further detail below, the NECPL has been designed to conform with this criterion.

Q51. Please describe the Project's design elements that will minimize soil erosion.

A51. Response: Earth disturbance associated with construction of the NECPL will result from tree clearing, cable installation where trenching will occur, HDD and Jack and Bore setup locations, temporary grading in the construction ROW where stable/level areas may be required, temporary laydown/staging areas at cable jointing locations, and grading for the proposed Converter Station.

A project-specific EPSC Plan will be prepared in accordance with the Vermont Standards and Specifications for Erosion Prevention and Sediment Control, in connection with the NPDES Construction Stormwater Discharge Permit. As a component of the EPSC plan, the following non-structural practices will be implemented:

- Construction phasing
- Winter construction methods
- Dewatering practices
- On-site Plan Coordinator (OSPC) responsibilities
- EPSC Specialist oversight
- Turbidity monitoring and reporting

A project-specific EPSC approach will be prepared utilizing EPSC measures selected and designed in compliance with VT DEC Standards & Specifications. As part of the EPSC approach, particular attention will be given to: (1) minimizing disturbance, (2) managing runoff, (3) stabilizing promptly, and (4) monitoring, maintaining, and, if necessary, adapting EPSC measures to evolving site conditions. Minimizing disturbance involves, to the extent practicable, maintaining existing topography, phasing major disturbance activities, and maintaining existing vegetation. With regard to managing runoff and stabilizing promptly, actions will be taken to (for example): maintain existing areas of concentrated flow (e.g., ditches), divert potential run-on, stabilize flow paths, disperse concentrated flows through EPSC measures, and stabilize areas of disturbed soil within a specified time frame. The management of construction phase stormwater runoff to ensure that Criterion 4 is met is described in greater detail in *Exh. TDI-JAN-7*.

Q52. Will the Project impact primary agricultural soils?

A52. Response: Although the Project cable alignment crosses areas mapped as primary agricultural soils, given the fact that these soils are located within existing transportation rights-of-way, such areas are not considered available for agricultural operations. With respect to the Converter Station site, no primary agricultural soils are present. Therefore the Project will not result in any reduction in primary agricultural soil availability.

Q53. Please describe how stormwater during Project construction will be addressed.

A53. Response: In addition to the measures described above, specific EPSC measures will be implemented in accordance with the Project EPSC Plan and the Vermont Standards and Specifications for Erosion Prevention and Sediment Control. They may include, but are not limited to:

- Workspace and sensitive resource flagging (e.g., barrier tape, exclusion fence)
- Vegetated buffers
- Silt fence and reinforced silt fence
- Staked hay bales
- Staked fiber rolls
- Water bars
- Stone check dams
- Diversions, berms, and earth dikes
- Temporary or permanent swales
- Rip rap slope protection
- Stabilized construction entrance/exit

- Inlet protection
- Sediment traps
- Dust control via water or calcium chloride application
- Sediment basins
- Trench breaks/plugs
- Rolled erosion control product (RECP)
- Concrete washout area
- Surface roughening
- Topsoil segregation
- Seed application
- Mulch application
- Construction mats

Q54. Please provide a construction sequence and identify how erosion control and stormwater control will be implemented.

A54. Response: With regard to phasing major disturbance activities, the general approach will typically involve the following sequence of activities:

1. Installation of specified EPSC measures (e.g., limits of disturbance barrier tape and fence, stabilized construction entrance, silt fence, sediment basins, sediment traps) prior to disturbance of any work area.
2. Clearing of vegetation with earth disturbance (e.g., removal of stumps) within work areas.
3. Construction of temporary access areas, staging areas.

4. Trench excavation, installation of cables, and backfill with appropriate materials.

5. Final stabilization and clean up.

As earthwork is completed, the area will be stabilized by means of gravel, seed/mulch, etc., in order to limit unstabilized soils which will be subject to potential erosion. The areas will then be cleaned up and permanently stabilized. Construction activities and EPSC measures will be inspected on regular intervals. The sequence of Project construction activities is described further in the Stormwater Technical Memo (***See Exh. TDI-JAN-7***) and the testimony of Alan Wironen.

Q55. Will the Project meet all applicable state regulations regarding stormwater?

A55. Response: Yes. Under the NPDES program and the Clean Water Act, construction projects that involve one (1) or more acres of land disturbance require a permit for the discharge of stormwater runoff associated with these construction activities. In Vermont, the NPDES program is administered by the VT DEC. For the NECPL, given the size of the Project and the preliminary risk analysis scoring using DEC methodology, it is expected that an Individual Construction Stormwater Discharge permit will be required.

The EPSC Plan will be implemented during construction in accordance with the anticipated Individual NPDES Permit conditions, through the completion of final post-construction stabilization. This will ensure that discharges of stormwater runoff from the construction of the NECPL will not result in undue soil erosion or the capacity of the land to hold water.

Q56. Does the Project require any collateral permits relating to the criteria you address above?

A56. Response: Yes. At this time, the following collateral permits or approvals for natural resource impacts are anticipated for the Project:

- Vermont Wetland Permit
- Individual Construction Stormwater Discharge Permit
- Operational Phase Stormwater Discharge Authorization Pursuant to GP 3-9015
- Section 401 Water Quality Certification
- USACE Individual Section 404 Permit
- Lake Encroachment Permit
- Stream Alteration Permit
- Discharge Permit(s) per 10 VSA Chapter 47

Q57. Does this conclude your testimony at this time?

A57. Response: Yes, it does.