STATE OF VERMONT
PUBLIC SERVICE BOARD

Docket No. 8400

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, to be known as the New England Clean Power Link Project	)	Hearing at Montpelier, Vermont October 20, 2015

Order entered: 1/5/2016

PRESENT: James Volz, Chairman
Margaret Cheney, Board Member
Sarah Hofmann, Board Member

APPEARANCES: *(See Attachment A)*

FINDINGS AND ORDER

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I. INTRODUCTION

This case involves a petition filed by Champlain VT, LLC, d/b/a TDI New England ("TDI-NE" or "Petitioner"), with the Vermont Public Service Board ("Board") for a certificate of public good ("CPG") under 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, also known as the New England Clean Power Link ("NECPL" or the proposed "Project"). The Project will be located within the Vermont portion of Lake Champlain and in the counties of Grand Isle, Chittenden, Addison, Rutland, and Windsor, Vermont. In today's Order, we conclude that, subject to numerous conditions negotiated by the parties as set forth in several memoranda of understanding, the Project will promote the general good of the State of Vermont, and a CPG shall be issued to that effect.

The NECPL will provide significant environmental, electrical, and economic benefits for Vermont and the region, including diversifying the state and regional fuel supply, reducing greenhouse gas emissions, creating in-state jobs, producing millions of dollars in new state and local taxes and public good benefits, and potentially lowering electricity costs. At the same time, the installation of the line underground in existing public rights-of-way ("ROWs") and underwater in Lake Champlain will help reduce the overall visual impacts of the Project. Finally, the NECPL will support Lake Champlain clean-up efforts, in-state renewable energy programs, and Vermont electric ratepayer relief through the creation of several public-good benefit funds.

Construction of the Project will not be without impacts. A large, above-ground converter station will be built to convert direct current ("DC") power to alternating current ("AC") so that the Project can interconnect with Vermont's transmission system. Additionally, travelers on the Vermont highways where the HVDC line will be installed underground will likely experience some measure of inconvenience during Project construction. However, we conclude that the Project's benefits are significant enough to outweigh any potential negative effects, thus promoting the general good of the state.

II. PROCEDURAL HISTORY

On December 8, 2014, TDI-NE filed with the Board a Section 248 petition with supporting materials requesting approval to install and construct the Project in Lake Champlain and overland across towns located in the counties of Grand Isle, Chittenden, Addison, Rutland, and Windsor.

On January 28, 2015, the Board held a prehearing conference.

On February 4, 2015, the Board issued a prehearing conference memorandum and scheduling order.

On February 24, 2015, the Board held a public hearing in Fair Haven, Vermont, at which ten individuals presented public comments on the Project.

On March 12, 2015, the Board issued an order granting intervention to 18 parties, subject to certain conditions: Addison County Regional Planning Commission ("ACRPC"), Chittenden County Regional Planning Commission ("CCRPC"), Northwest Regional Planning Commission ("NWRPC"), Southern Windsor County Regional Planning Commission ("SWCRPC"), Town of Benson ("Benson"), Town of Rutland ("Rutland"), Town of Fair Haven ("Fair Haven"), Town of Wallingford ("Wallingford"), Conservation Law Foundation ("CLF"), City of Burlington Electric Department ("BED"), Green Mountain Power Corporation ("GMP"), Vermont Electric Power Company, Inc. and Vermont Transco LLC (together "VELCO"), Vermont Division for Historic Preservation ("VDHP"), Vermont Agency of Transportation ("VTrans"), and adjoining landowners Sharon Combes-Farr, Bruce Farr, and Ruth and William Combes.

On May 21, 2015, the Board held a site visit, which included traversing the length of the overland portion of the Project route, including stops at Project locations in Benson and Ludlow.

On June 15, 2015, CCRPC and ACRPC each filed letters with the Board requesting that the Board refrain from including any conditions in a CPG issued for the Project that would preclude the ability of their member towns to levy property taxes against the underwater portion of the NECPL.[1]

1. ACRPC's letter was subsequently admitted into evidence as exhibit ACRPC-1. Tr. 10/20/15 at 7-8.

On June 12, 2015, the Vermont Agency of Natural Resources ("ANR"), the Department, GMP, VDHP, and BED each prefiled direct testimony with the Board, and the Petitioner filed with the Board an agreement between TDI-NE and CLF ("CLF Agreement").[2]

On June 15, 2015, VELCO prefiled direct testimony with the Board.

On June 24, 2015, the Board issued a procedural order approving a protective agreement between TDI-NE and the Vermont Department of Public Service (the "Department").

On July 17, 2015, the Petitioner filed stipulations and agreements between TDI-NE and GMP ("GMP Stipulation") and among TDI, the Department, ANR, and VDHP (collectively, "DPS/ANR/DHP Stipulation"); filed host town agreements with the towns of Alburgh ("Alburgh Agreement"), Benson ("Benson Agreement"), and Ludlow ("Ludlow Agreement"); and filed a lease option agreement with VTrans ("VTrans Agreement").[3]

On July 24, 2015, the Petitioner filed a stipulation and a first amended agreement with VELCO ("VELCO Stipulation" and "VELCO Agreement," respectively).[4]

On July 28, 2015, the Petitioner filed a stipulation with BED ("BED Stipulation").[5]

On August 26, 2015, TDI-NE prefiled supplemental testimony describing updates to the Project that reflected certain terms and conditions in the stipulations and agreements that it had reached with the various parties.

On October 14, 2015, the Department prefiled supplemental testimony and a letter, pursuant to 30 V.S.A. § 202(f) stating that Project is consistent with the Vermont twenty-year electrical energy plan.

On October 19, 2015, TDI-NE prefiled corrections to the testimony of three of its witnesses.

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2. The CLF Agreement was entered into evidence as exhibit TDI-JMB-20.

3. These documents were admitted into evidence as exhibits TDI-JMB-22, TDI-JMB-19a, TDI-JMB-24a-c, and TDI-JMB-25, respectively. The DPS/ANR/DHP Stipulation, exhibit TDI-JMB-19a, was subsequently amended by an additional agreement that was admitted into evidence as exhibit TDI-JMB-19b.

4. These documents were admitted into evidence as exhibits TDI-JMB-21 and TDI-JMB-7a (exhibit TDI-JMB-7a amended a prior agreement between TDI and VELCO that was admitted into evidence as exhibit TDI-JMB-7, collectively referred to herein as the "VELCO Agreement").

5. The BED Stipulation was admitted into evidence as exhibit TDI-JMB-23.

On October 20, 2015, a technical hearing was held in the Board's hearing room in Montpelier, Vermont.

III. SUMMARY OF COMMENTS RECEIVED DURING THE PUBLIC HEARING

Ten individuals commented on the Project during the February 24, 2015, public hearing held at Fair Haven Union High School. The majority of speakers supported the Project, citing the need to replace power from the closed Vermont Yankee nuclear plant with renewable energy, the minimal aesthetic impacts of the Project, increased tax revenues, and the responsiveness they experienced when interacting with representatives of TDI-NE. Speakers opposing the Project questioned whether it was actually needed and how Vermont would benefit if the power delivered over the line was not used in Vermont but went elsewhere in New England. Still other commenters expressed concerns about potential effects of the Project on Lake Champlain and the aquatic life there. One speaker questioned the aesthetic effects for locations where the cable would transition from below ground to above ground, expressed concerns over potential health impacts from the high-voltage cable, and expressed concern over the length of time that certain portions of roadways might be subject to excavation. Another speaker questioned the benefits of a project that would rely on large-scale hydroelectric facilities as the source of power to be transmitted over the line.

IV. FINDINGS

Background and Project Overview

TDI New England

1. The Petitioner is a limited liability company organized and existing pursuant to the laws of the state of Delaware. TDI-NE is authorized to do business in Vermont and is in good standing. Donald Jessome, Eugene Martin, and Joshua Bagnato, TDI-NE ("Jessome Panel") pf. at 5.[6]

6. References to the Jessome Panel prefiled direct testimony and supplemental testimony incorporate all corrections thereto set forth in the prefiled testimony dated October 19, 2015.

2. TDI-NE is owned by the Blackstone Group, a publicly traded global investment and advisory firm with $284 billion under management as of September, 2014. Jessome Panel pf. at 6.

3. TDI-NE has acknowledged that it will be subject to Board jurisdiction under 30 V.S.A. § 231 if it receives approval to construct and operate the Project. Under agreements reached with DPS and VELCO, TDI-NE has agreed to file a petition with the Board requesting a Section 231 CPG within 30 days after the Board issues a Section 248 CPG for the Project. Exhs. TDI-JMB-7a at 3; TDI-JMB-19a at 13.

Project Description

4. The NECPL will run from the Canadian border to Ludlow, Vermont, along underwater and underground routes. The electricity transmitted through the NECPL will be generated by renewable energy sources in Canada and delivered through Vermont into New England. The transmission line will utilize HVDC technology and have the capacity to transmit 1,000 MW of electricity at a nominal operating voltage of 300 to 320 kV (+/-). TDI-NE also proposes to construct a converter station and other associated facilities in Ludlow, Vermont, for the conversion of the NECPL's electricity from DC to AC (the "Converter Station"). Jessome Panel pf. at 6-7 and 20; exh. TDI-JMB-2.

5. TDI-NE anticipates that the line will operate at up to 95% of its capacity and is expected to deliver 8,322 gigawatt hours ("GWh") of power per year, which is equivalent to the energy used by approximately 1 million homes. Jessome Panel pf. at 20-21.

6. The NECPL's HVDC transmission line will be comprised of two approximately 5-inch cables, will be solid dielectric, and will contain no fluids or gases. Jessome Panel pf. at 27; exh. TDI-LE-4.

7. The cables in the Lake Champlain segment will be XLPE[7] HVDC with polyethylene insulation that eliminates the need for fluid insulation, enables the cable to operate at higher temperatures with lower dielectric losses, improves transmission reliability, and reduces the risk of network failure. Jessome Panel pf. at 28-29; exh. TDI-JMB-5 (revised).

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7. XLPE stands for cross-linked polyethylene.

8. The underwater cable will be installed using one of four methods, depending on water depths and conditions: jet-plow trenching, shear-plow trenching, hand trenching assisted by divers, or laid on the bottom without trenching. The cables will be stacked vertically in plow trenches and strapped together horizontally for bottom-laid self-burial. Jessome Panel pf. at 28-29; exh. TDI-JMB-5 (revised).

9. For the underground transmission cables, the outer sheathing insulation will be composed of an ultraviolet-stabilized, extruded polyethylene layer. The underground transmission cables will have a diameter of approximately 4.6 inches and each cable will weigh approximately 20.2 pounds per foot. Jessome Panel pf. at 29; exhs. TDI-AW-3 (revised); TDI-LE-4.

10. The NECPL will utilize a fiber optic cable system that will consist of a separate, armored, multi-strand fiber optic single-mode cable, approximately one inch in diameter, to be installed over the total distance of the NECPL from the converter station in Canada to the Ludlow converter station. The fiber optic cable will facilitate HVDC control. Jessome Panel pf. at 28.

11. The 56-mile-long overland portions of the transmission line will be buried approximately four feet underground within existing public road ROWs or railroad ROWs, except for an above-ground bridge crossing and an above-ground culvert crossing, both in the town of Ludlow. Jessome Panel pf. at 30; exh. TDI-AW-2 (revised).

12. The overland route will go through the following Vermont towns: Alburgh, Benson, Castleton, Cavendish, Clarendon, Fair Haven, Ira, Ludlow, Mount Holly, Rutland, Shrewsbury, Wallingford, West Haven, and West Rutland. Jessome Panel pf. at 25, 30; exhs. TDI-AW-2 (revised); TDI-JMB-3.

13. From the US-Canadian border, the transmission line will be installed under a town road in Alburgh, and then underground through TDI-NE-owned land, for a total distance of approximately 0.5 miles. Jessome Panel pf. at 30.

14. The transmission cables will enter Lake Champlain via horizontal directional drilling ("HDD") in Alburgh. The line will run approximately 98 miles buried in the bed of Lake Champlain (except at water depths of greater than 150 feet, where the cables will be placed on

the lake bottom and allowed to self-bury) entirely within the jurisdictional waters of the state of Vermont, until it exits the lake in the town of Benson, Vermont, via HDD. Jessome Panel pf. at 29; Sean Murphy, TDI-NE ("Murphy") pf. at 4; exh. TDI-JMB-4 (revised).

15. From the Lake Champlain exit point in Benson, the transmission line will be buried in public ROWs or private property controlled by TDI-NE, as follows (distances are approximate):

- TDI-NE land to Benson town roads east to VT Route 22A (4.3 miles)
- VT Route 22A south to US Route 4 in Fair Haven (8.2 miles)
- US Route 4 east to US Route 7 in Rutland (17.4 miles)
- US Route 7 south to VT Route 103 in North Clarendon (2.7 miles)
- VT Route 103 south/southeast to VT Route 100 in Ludlow (14.4 miles)
- Excursion off Route 103 onto railroad ROW in Shrewsbury (3.5 miles)
- VT Route 100 north to Ludlow town roads (0.8 miles)
- Ludlow town roads to the proposed converter station (4.4 miles)
- Converter station to VELCO Coolidge substation (0.6 miles)

Jessome Panel pf. at 30-31; exhs. TDI-JMB-2, TDI-AW-2 (revised).

16. In the town of Rutland, US Route 4 crosses over a public highway of the Town of Rutland, known as Creek Road, via an overpass. The Project cables, fiber optic line, and associated equipment will be installed under Creek Road by HDD to a depth of 18 feet+/- beneath the surface of Creek Road. Exh. TDI-AW-2 (revised) at sheet T-51; 10/20/15 tr. at 27-28 (Martin).

17. The transmission line will tie into TDI-NE's proposed converter station in Ludlow, Vermont, where electrical power flowing over the line will be converted from DC to AC and then injected into VELCO's 345 kV Coolidge substation in Cavendish, Vermont. Jessome Panel pf. at 6-7; exhs. TDI-JMB-2; TDI-JMB-8; TDI-AW-2 (revised).

18. TDI-NE has interconnection requests filed with TransEnergie, the transmission subsidiary of Hydro-Quebec, to determine the location and equipment required to safely and securely connect the NECPL in Canada. At a minimum, it is expected that a small amount of high-voltage alternating current ("HVAC") equipment, a new HVAC-HVDC converter station,

and an HVDC cable system would be needed at or near the Quebec-Vermont border. Jessome Panel pf. at 9-10.

19. The Project's two HVDC cables will be connected to an HVDC voltage source converter station that uses high-voltage semi-conductor technology to provide both enhanced system stability and precise power flow. Additionally, the power losses on HVDC technology are very low over long distances when compared to HVAC technology. Jessome Panel pf. at 10; Larry Eng, TDI-NE ("Eng") pf. at 10; exh. TDI-LE-3.

20. HVDC technology provides the ability to precisely and continuously control the flow of energy over the NECPL by directly controlling the power electronics at the converter station, thus allowing the NECPL to be fully dispatchable by ISO-NE. The NECPL will also be able to help ISO-NE in recovery from a major regional power outage. Eng pf. at 10-11.

21. While TDI-NE has not yet entered into contracts with any renewable energy suppliers, TDI-NE intends to use the NECPL to transmit electricity generated by hydroelectric, wind, or other renewable energy sources located in Canada for delivery in Vermont and New England. Jessome Panel pf. at 11.

22. The NECPL is subject to regulation by the Federal Energy Regulatory Commission ("FERC") under the Federal Power Act. On March 10, 2014, FERC issued an order conditionally authorizing TDI-NE to sell transmission rights for the Project at negotiated rates.[8] Pursuant to that order, TDI-NE must turn over operational control of the Project to ISO-NE, and ISO-NE will operate the transmission line pursuant to ISO-NE's FERC-approved open access transmission tariff. Jessome Panel pf. at 19-20.

23. Pursuant to its authority from FERC, TDI-NE will sell transmission rights to power generators or other suppliers/marketers. They will, in turn, sell the power that is transmitted via the Project to New England area utilities that will deliver that output to retail customers. Jessome Panel pf. at 20.

8. 146 FERC ¶ 61,167 (2014).

The Converter Station

24. TDI-NE initially identified and secured control over two properties on Nelson Road in Ludlow, Vermont, as suitable sites for the converter station and later acquired additional space that enabled the converter station to be sited farther away from a nearby residence and within a mature pine forest that will provide screening of the station from public roads. Jessome Panel pf. at 15-16; exhs. TDI-JMB-8; TDI-AW-2 (revised).

25. TDI-NE's Ludlow properties are in close proximity to VELCO's Coolidge substation. Existing vegetation and topography will provide visual screening and reduce the need for excavation. Jessome Panel pf. at 16.

26. The converter station will utilize voltage source converter technology, which will lower system losses, increase stability, and improve power transfer and voltage control capabilities, as well as allowing for a smaller physical footprint for the station. Jessome Panel pf. 31; exhs. TDI-JMB 8; TDI-JMB-9.

27. The total post-construction site area for the converter station, including the building and associated areas and equipment, will be approximately 4.5 acres; the total amount of land to be cleared for construction will be approximately 10 acres; the converter station building will have a footprint of approximately 165 feet by 325 feet, approximately 1.2 acres. Jessome Panel pf. at 32; exh. TDI-JMB-8.

28. The converter station will be surrounded by secure fencing that will be compliant with the National Electrical Safety Code and other applicable industry standards. The indoor design of the converter station will limit the need for exterior switchyards and will reduce audible sound from those components. It is anticipated that transformers, cooling equipment, and power line carrier filters will be the major equipment installed outside the building. Jessome Panel pf. at 32; exh. TDI-JMB-8.

29. From the converter station, a 345 kV (AC) transmission line will be installed underground within a duct bank for approximately 0.3 miles on a public road to connect the converter station with the VELCO Coolidge substation. Jessome Panel pf. at 32; exh. TDI-AW-2 (revised).

Selection of Transmission Line Route

30. TDI-NE evaluated a number of route alternatives from the Canadian border to the Coolidge substation, focusing on alternatives that utilized Lake Champlain as the primary route and utilized buried HVDC technologies and public ROWs. TDI-NE also evaluated several above-ground and underground routes that did not utilize Lake Champlain, but the non-lake or overhead alternatives were deemed impracticable due to cost, logistics, or technological constraints. Jessome Panel pf. at 13.

31. The proposed route through Lake Champlain is based on a number of factors: (1) the route needed to begin near the US-Canadian border and be entirely within the state of Vermont; (2) water depths needed to be greater than 20 feet to the extent practical to allow for the typical draft of installation vessels; (3) areas with known geological obstacles, such as bedrock outcrops, were to be avoided to the extent feasible; (4) the entire route, including the entry and exit points, was evaluated based on a number of logistical factors, including avoidance of impacts to sensitive species, habitats, and cultural features, availability of property, and access to existing overland ROWs. Murphy pf. at 5-6.

32. Once an approximate route using the lake and public ROWs was developed, TDI-NE evaluated numerous overland route segments. The most direct east-west route from the lake to Benson and then overland to Ludlow was selected based on considerations for avoiding sensitive and difficult sections of Lake Champlain and the Green Mountain National Forest, crossing the Green Mountains over the flattest route possible, and staying on existing public ROWs to avoid the use of private property. Once a preliminary route was determined, it was previewed with state and federal regulators and then in many meetings with town representatives along the overland portion of the route. As a result of feedback received at these meetings, several adjustments to the original route were made in Alburgh, Benson, Shrewsbury, Wallingford, and Ludlow. Jessome Panel pf. at 14.

33. In consideration of potential traffic impacts and flood-prone areas, TDI-NE further modified the route to avoid a narrow segment of Route 103 in Cuttingsville, Vermont, by utilizing a 3.5-mile segment of an existing railroad corridor. Alan Wironen, TDI-NE ("Wironen") pf. at 10; exh. TDI-AW-2 (revised).

34. Because the overland route was proposed primarily within the VTrans ROW, regular meetings were scheduled with VTrans representatives. Further, multiple meetings occurred in the towns of Alburgh, Benson, and Ludlow where the cable is proposed to be located within town roads. Based on meetings and feedback received through approximately one year of outreach with regulators, town officials, abutters, nonprofit organizations, regional planning commissions, and TDI-NE consultants, the proposed route was advanced. Jessome Panel pf. at 14-15.

Discussion

There appears to be some disagreement between TDI-NE and the Town of Rutland over whether Rutland has the authority to assess taxes against that portion of the overland route that will cross beneath Creek Road and whether a town permit is needed for the installation. Rutland has requested that we replace TDI-NE's proposed finding 104 with a finding that acknowledges the as-yet-undetermined status of not only the taxability of that portion of the line, but also whether TDI-NE must obtain a permit from the Town pursuant to 30 V.S.A. § 2502 and 19 V.S.A. § 1111(a) and (c). Rutland further requests that we alter TDI-NE's proposed table of outstanding permits to reflect what Rutland believes is the undetermined status of that permit.[9]

The Public Service Board is not the appropriate forum for deciding whether TDI-NE must obtain a permit from Rutland to install the line where it will cross beneath the surface of Creek Road, nor is it the proper forum for determining whether that segment of the line is subject to municipal taxation by the town. Accordingly, we have altered TDI-NE's proposed finding 104[10] by removing the conclusion that the line will remain in the US Route 4 ROW while crossing beneath Creek Road. We have also added the "to be determined" status of a Rutland ROW permit to the list of outstanding collateral permits for the Project. Nothing in our Order should be interpreted to establish what the Town of Rutland's rights may or may not be with respect to these issues.

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9. Rutland Brief at 1-2.

10. The proposed finding was relocated to finding 16 in this Order.

Operation and Maintenance

35. With the exception of system monitoring, the NECPL will be largely unmanned after commissioning. Controls will be automated, with power delivered as "base load" and remote operations being managed by TDI-NE. ISO-NE will have operational control of the NECPL. Field support of system operations will be provided in consultation with the manufacturer through a contracted specialty transmission-services provider. Jessome Panel pf. at 50.

36. The NECPL has an expected life span of at least 40 years. Jessome Panel pf. at 50.

37. The HVDC and HVAC transmission cables themselves will be virtually maintenance-free, as they will be installed within specified design and field condition parameters. Although no components of the transmission system will require regular replacement, regular inspections in accordance with the manufacturer's specifications will be performed during scheduled outages to ensure that equipment integrity is maintained. Jessome Panel pf. at 50.

38. The aquatic portion of the NECPL will be surveyed at least once every five years, and inspections will focus on verifying the depth of cable burial, checking the condition of infrastructure protection measures, and identifying areas where protection of the transmission system or the environment could be compromised. Aquatic transmission cables will be inspected by remotely operated vehicles ("ROVs") and magnetometers to ensure that cables remain in their installed positions and that protection and co-location schemes are in place with full integrity. Jessome Panel pf. at 51.

39. The overland cable will be inspected approximately every three years to ensure that adequate cover exists. In addition, following the installation of the transmission cable, annual walkdown inspections will be conducted of the transmission cable ROWs, splice vaults, and duct banks to ensure that cables are fully secure and that there is no potential intrusion or activity that could affect cable operation. Jessome Panel pf. at 51.

40. Throughout normal operations, the converter station will require minimal on-site personnel. Maintenance activities at the converter station, including inspections, testing, and preventative maintenance, are expected to occur regularly throughout the life of the transmission line, focusing on inspection and repair of balance-of-plant components, optimizing and annual testing of the system, and general maintenance and cleaning of components, such as transformers

and coolers. The permanent stormwater features at the converter station will be inspected and maintained as required by the applicable permits. Jessome Panel pf. at 51-52.

41. During operation of the NECPL, vegetation clearing in the transmission line ROW will be performed on an as-needed basis. This clearing will likely occur only in segments of the ROW that are not receiving ongoing clearing by VTrans or the railroad. Vegetation management will include mowing, selective cutting, and vegetation clearing on an as-needed basis to conduct repairs. Vegetation along the transmission line ROW will primarily be managed by mechanical means including brush hogging, mowing, and hand cutting. Jessome Panel pf. at 52.

42. Any vegetation-management activities currently conducted by VTrans or the railroad within the ROWs will continue following the construction and operation of the transmission cable. A vegetation-management plan for the transmission system has been developed. The goal of the plan is to establish stable, low-growing vegetation with shallow root systems that will not interfere with the cables. Jessome Panel pf. at 52-53, exh. TDI-JAN-12 (revised).

43. While not anticipated, it is possible that over the expected 40-year life of the Project the transmission cables may require repair. If a cable is damaged, a protection system will detect the fault, and the Ludlow and Quebec HVDC converter-station switching systems will de-energize the transmission system immediately. If a repair is needed in a section of the aquatic portion of the route, a portion of the transmission cable equal to approximately 2.5 times the water depth will be excavated in preparation for cable replacement. The damaged portion of the cable will be cut and a new cable section will be spliced in place by specialized jointing personnel. Once repairs are completed, the transmission cable will be re-buried. Jessome Panel pf. at 53-54; Murphy pf. at 11.

44. Before Project operations begin, an emergency repair and response plan ("ERRP") will be prepared to identify procedures and contractors necessary to perform maintenance and emergency repairs. The ERRP will detail the activities, methods, and equipment involved in repair and maintenance work for the transmission system. Jessome Panel pf. at 53.

Permitting and Construction Schedule

45. The Department of Energy ("DOE") must issue a Presidential Permit for any electric transmission facilities that connect at the international border. The United States Army Corps of Engineers ("USACE") issues permits for activities in the navigable waters of the United States and related infrastructure. As noted above, FERC has conditionally granted TDI-NE the authority to sell transmission rights at negotiated rates. The Federal Highway Administration must concur with the Vermont Agency of Transportation's decision to grant a Section 1111 permit for use of the Route 4 ROW. Review by all of these agencies will be informed by and predicated on a full review of the Project's environmental impacts pursuant to the National Environmental Policy Act ("NEPA"). The DOE is the lead federal agency for the purpose of conducting the NEPA review. Jessome Panel pf. at 26.

46. ANR and its departments will play a central role in reviewing the Project's potential effects on key environmental resources – Lake Champlain, wetlands and streams, threatened and endangered species, and possibly others – prior to issuing any permit decisions. Jessome Panel pf. at 26-27.

47. A list of major collateral permits and their status is as follows:

Permit	**Issuing Agency**	**Status**
401 Water Quality Certificate	VT ANR/DEC	Application filed
Lake Encroachment Permit	VT ANR/DEC	Application filed
Stream Alteration Permit	VT ANR/DEC	Application filed
Wetland Permit	VT ANR/DEC	Application filed
Construction Stormwater Permit	VT ANR/DEC	Application filed
Operational Stormwater Permit	VT ANR/DEC	Application filed
Takings Permit	VT ANR	Application filed
Section 1111 Right-of-Way Permit	VTrans	Letter of intent issued
Section 1111 Right -of-Way	Towns of Alburgh, Benson,	Addressed in host town

Permit	and Ludlow	agreements
Section 1111 Right-of-Way Permit	Town of Rutland	To be determined
Sections 404/10 Permits	USACE	Application filed
Presidential Permit and NEPA determination	US DOE	Application filed

Jessome Panel pf. at 27; Jessome Panel supp. pf. at 17-19; exh. TDI-JMB-11 (revised).[11]

48. TDI-NE expects that the permitting phase of the Project will be completed by the end of 2015. Pre-construction activities related to the qualification and selection of contractors are planned to commence in 2015. Construction-related engineering activities are expected to commence in 2016 and continue through early 2019 with performance testing and commissioning. TDI-NE anticipates that the commercial operations for the NECPL will commence in the second quarter of 2019. Jessome Panel pf. at 55; exh. TDI-JMB-11 (revised).

49. Within Lake Champlain, construction would occur 24 hours per day, 7 days per week to enable the lake installation to occur as quickly as possible and during a single work season. The in-lake work will generally be very distant from private property and will not involve activities that generate undue levels of noise. Jessome Panel pf. at 55.

50. TDI-NE has agreed to limit route clearing and installation activities in Lake Champlain as follows: between mile post ("MP") 1 and MP 74, from June 1 to October 1; and between MP 74 and MP 98, from June 1 to December 31. This installation schedule does not apply to the land-to-lake HDD activities, provided that: (i) the HDD activities are conducted in a manner that prevents the introduction of sediment into, or the creation of turbidity within, the lake beyond the immediate vicinity of the in-water HDD entry point and (ii) the in-water HDD activities do not occur before May 1 or after October 1 in the northern portion of the lake. Murphy supp. pf. at 6; exh. TDI-JMB-19a, Attachment II at 4.

11. The Board makes no ruling as to the applicability of the Section 1111 permit in Rutland, *see supra,* discussion at 14.

51. For the overland route, the hours of construction will be Monday through Friday from 7 A.M. to 7 P.M., and Saturdays from 8 A.M. to 5 P.M. No work will take place on Sundays, state holidays, or federal holidays. Jessome Panel pf. at 56.

52. Blasting operations will be limited to 9 A.M. to 5 P.M., Monday through Friday. Jessome Panel pf. at 56.

53. Where TDI-NE is conducting HDD, it may continue the drill up to 24 hours per day, including weekends and holidays, as necessary to complete the drilling operation. Jessome Panel pf. at 56.

54. Where TDI-NE is working in close proximity to residences, consideration in planning and executing the construction work will attempt to minimize the overall duration of the impact on those residences, and TDI-NE will provide residents with reasonable advance notice of 24-hour HDD operations. Jessome Panel pf. at 56.

Decommissioning

55. TDI-NE will evaluate the continued viability of the NECPL's existing infrastructure prior to the end of its useful life to determine whether it can continue to operate or whether the NECPL should be upgraded, subject to any necessary approvals. Jessome Panel pf. at 57.

56. TDI-NE and the Department have agreed to the following protocol for decommissioning:

i. Prior to the commencement of construction, TDI-NE shall file for Board review and approval a decommissioning plan that provides for the off-site removal of the converter station building and all structural steel components and the restoration of the converter station site to a stabilized condition allowing for natural revegetation. TDI-NE shall also provide a cost estimate for the decommissioning activities as part of the decommissioning plan.

ii. TDI-NE has agreed to file the NECPL's transmission service agreements (supply contracts) with the Board, and to regularly monitor those contracts for use of the transmission line within 30 days of execution, redacted or under seal as necessary to protect confidential business information, as evidence that the facility is in use. If at any time TDI-NE's review of those contracts reveals that within two years, contracts for the use of the transmission line will

fall below 50% of total line capacity, then TDI-NE will notify the Board and parties. At that time, the Board will initiate a proceeding to investigate the appropriateness of establishing a decommissioning fund. Failure to use the converter station, other than during planned or unplanned outages or repairs, for a period of eighteen consecutive months shall trigger Board review of whether the converter station should be decommissioned.
Jessome Panel supp. pf. at 24; exh. TDI-JMB-19a at 9-10.[12]

57. When the NECPL ceases to operate, the cables located within the lake and underground will be de-energized but will be left in place. As necessary, TDI-NE will provide state and local officials with accurate and detailed information on the location of the line. Jessome Panel pf. at 57.

58. VTrans and the host towns of Alburgh, Benson, and Ludlow have granted TDI-NE permission to leave the cables in place in all town and state road ROWs after the Project ceases operating. Exhs. TDI-JMB-24a at 2; 24b at 2; 24c at 2; exh. TDI-JMB-25 at A-1.

Discussion

The terms and conditions of the DPS/ANR/DHP Stipulation allow for the construction and operation of the Project without the initial establishment of a decommissioning fund. A decommissioning fund is only required if review of TDI-NE's contracts with its transmission customers indicates that usage of the transmission line will fall below a specified capacity percentage within a specified period of time and then only after a hearing before the Board on the necessity for establishing such a fund.

This decommissioning approach to a large-scale merchant project is a departure both from Board precedent and from the Department's normal practice of advocating for the establishment of a decommissioning fund prior to construction of such a project.[13] However,

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12. In summarizing the Stipulation, the JMB Panel supplemental testimony stated, "in the event that the contracts reveal the use of the transmission line will fall below 50% of its capacity for a two-year period . . . ." The testimony incorrectly summarized the Stipulation, which provides, "If at any time TDI-NE's review of those contracts reveals that within two years, contracts for use of the transmission line will fall below 50% of total line capacity . . . ." The Stipulation language controls. Tr. 10/20/15 at 37-38 (Jessome).

13. *See e.g. Petition of Rutland Renewable Energy, LLC*, Docket 8188, Order of 3/11/15 at 69-71.

according to the Department, the terms in the DPS/ANR/DHP Stipulation that relate to decommissioning are part of a comprehensive settlement that the Department supports. The Department also believes that the Project components will have substantial salvage value and will provide an incentive for TDI-NE to decommission the Project at the end of its useful life.[14]

After much consideration, we have decided to accept the decommissioning proposal set forth in the DPS/ANR/DHP Stipulation. In doing so, we note that we are making an exception to our standard practice of requiring decommissioning funds prior to the construction of large-scale merchant projects reviewed under Section 248. We are making this exception because the two state entities that are charged statutorily with overseeing impacts related to the decommissioning of the Project have signed the DPS/ANR/DHP Stipulation and recommend that we accept it in all material respects. The parties should not view our acceptance of the proposed decommissioning terms as an indicator that we are necessarily willing to depart from our practice of requiring decommissioning funds for large-scale merchant projects in either pending or future Section 248 proceedings.

Funding of the NECPL

59. The cost of constructing the NECPL is approximately $1.209 billion, and the initial year's operating expenses for the Project are estimated to be $40.6 million. Exh. TDI-TS-2 (revised).

60. The NECPL will be privately developed and financed as a merchant facility by TDI-NE and the Blackstone Group. As such, TDI-NE has not proposed to seek to recover the costs of the Project through charges paid by retail electric ratepayers. Rather, it will recover its costs of construction and operation through the payments it will receive from power suppliers who will contract to utilize capacity on the NECPL transmission line. Jessome Panel pf. at 17.

61. If the Project is funded through ISO-NE's pooled transmission mechanism, through FERC Order 1000, or through another cost-sharing mechanism, TDI-NE has agreed to indemnify Vermont's regionally allocated share of the costs by making additional payments to VELCO to ensure that Vermont's retail electric customers accrue the net benefits agreed upon by VELCO

14. Tr. 10/20/15 at 51 (McNamara).

and TDI-NE. TDI-NE further agrees not to seek cost recovery for these additional indemnification payments under the ISO-NE tariff or any other cost-sharing mechanism that allocates costs to Vermont ratepayers. Exh. TDI-JMB-7a.

62. Under the first amendment to the DPS/ANR/DHP Stipulation, the Department has agreed to use its best efforts to minimize Vermont's regional share of the NECPL's costs in the event the Project is funded through FERC Order 1000 or another cost-sharing mechanism, and, in which case, TDI-NE would be subject to the indemnification requirements in its agreements with VELCO. Exh. TDI-JMB-19b.

Discussion

TDI-NE has proposed to develop the Project as a merchant facility and thereby recover its costs through contracts with its transmission customers rather than from retail electric ratepayers. However, TDI-NE acknowledges that there may be an opportunity for it to recover costs through a regional cost-sharing mechanism that could result in a portion of the Project's costs being allocated to Vermont ratepayers. The Department expressed some concern over this possibility but ultimately decided that its concern was appropriately addressed by the indemnification provision in TDI-NE's agreements with VELCO.[15]

We agree with the Department that the indemnification provisions in TDI-NE's agreements with VELCO provide appropriate protection to Vermont's retail ratepayers in the event Project costs are recovered through a regional cost-sharing mechanism.

Stipulations and Other Agreements

63. TDI-NE has entered into the following agreements and stipulations:

i. DPS, ANR, and VDHP, stipulation dated July 17, 2015, and first amendment dated July 29, 2015. Exhs. TDI-JMB-19a and 19b.

ii. CLF agreement dated May 28, 2015. Exh. TDI-JMB-20.

iii. VELCO stipulation dated July 24, 2015. Exh. TDI-JMB-21.

15. Tr. 10/20/15 at 45-46 (McNamara).

iv. VELCO agreement dated December 4, 2014, and first amendment dated August 22, 2015. Exhs. TDI-JMB-7 and 7a.

v. GMP stipulation dated July 17, 2015. Exh. TDI-JMB-22.

vi. BED stipulation dated July 28, 2015. Exh. TDI-JMB-23.

vii. Host town agreements with the Town of Alburgh dated June 1, 2015, the Town of Benson dated June 10, 2015, and the Town of Ludlow dated July 2, 2015. Exhs. TDI-JMB-24a through 24c, respectively.

viii. VTrans lease option agreement dated July 17, 2015. Exh. TDI-JMB-25.

ix. License for Fish & Wildlife Access Area dated March 17, 2015. Exh. TD1-JMB-26.

64. Among other things, these stipulations and agreements: (i) substantially increase the public benefit payments to Vermont and its ratepayers and to state and local entities; (ii) provide for mitigation of potential environmental impacts; (iii) address potential transmission and/or subtransmission upgrades that may be required in Vermont as a result of the Project; and (iv) secure the ROWs necessary for the entire overland segment of the Project. Jessome Panel supp. pf. at 2-3.

65. These stipulations and agreements resolve all issues presented by the signatory parties, including all parties in the docket who prefiled direct testimony. Jessome Panel supp. pf. at 3.

Substantive Criteria of Section 248(b)

Orderly Development of the Region

[30 V.S.A. § 248(b)(1)]

66. The Project will not unduly interfere with the orderly development of the region, with due consideration having been given to the recommendations of the municipal and regional planning commissions, the recommendations of the municipal legislative bodies, and the land conservation measures contained in the plan of any affected municipality. This finding is supported by findings 67 through 82, below.

67. In designing the Project and compiling the petition and supporting materials for the Section 248 process, TDI-NE considered the comments it received in discussions with town officials, regional planning commission officials, and local residents, including meetings with the

selectboards of the towns along the overland route, briefing of five regional planning commissions, open houses held in six locations, and a public symposium held in Burlington regarding the lake-based portions of the Project. TDI-NE also issued its 45-day notice letter to all towns along the Project route. Jessome Panel pf. at 59-60; exhs. TDI-JMB-12; TDI-JMB-15.

68. By way of example, TDI-NE considered local input in several instances:

i. In response to requests from citizens and business owners within the Village of Cuttingsville in the town of Shrewsbury, TDI-NE modified its route to avoid the village. Jessome Panel pf. at 63.

ii. TDI-NE developed the proposed route in the town of Benson based upon a review of several routes along town roads. TDI-NE discussed and toured the proposed route with the town. Jessome Panel pf. at 63-64.

iii. The location of the cable was moved to a different portion of land owned by TDI-NE in the town of Alburgh, per the request of the adjoining landowner. The cable was also moved to a different portion of Bay Road, per the request of the Town Selectboard. Jessome Panel pf. at 64; Jessome Panel supp. pf. at 21.

69. TDI-NE reached host town agreements with Alburgh, Benson, and Ludlow. The agreements address, among other things, the use of the town roads, review of project plans, property taxes and other payments, and communication during construction. Jessome Panel supp. pf. at 11-13; exhs. TDI-JMB-24a through 24c.

70. TDI-NE's agreement with Benson also includes payments to the town for the purchase of equipment and infrastructure for town maintenance and emergency services. The agreement requests that the Board incorporate the full terms of the agreement by reference into a CPG for the Project. Exh. TDI-JMB-24b at 2, 11.

71. By locating the transmission line in the lake and within public ROWs, the NECPL will not utilize land or resources that are otherwise needed or planned for other forms of development within the region. Construction access to these ROWs requires minimal upgrades. Jessome Panel pf. at 62-63.

72. The Project is consistent with all of the relevant provisions of the town plans for the communities along the overland route. The majority of municipal plans include general language

seeking to encourage the preservation of natural and cultural resources and designate resource protection and/or preservation land-use categories within which development is significantly restricted. Most of the plans have language that discourages sprawl development and encourages the development of renewable energy resources. Buscher pf. at 3; exh. TDI-MB-2.

73. The Project will be consistent with these types of general provisions, as well as any limited land-conservation measures applicable to areas in which the Project is located. The Project's cables will be buried entirely underground within existing road and railroad ROWs, with the exception of one bridge and one culvert crossing, both in Ludlow. These ROWs are already established features within these communities, and many already contain existing above-ground and below-ground utility infrastructure. The buried configuration of the line results in minimal encumbrances. Buscher pf. at 3-4.

74. The Northwest Regional Plan provides specific policies for utility ROWs, including design principles for transmission lines: (1) ROWs shall not divide land uses, particularly agricultural lands and large contiguous forest parcels; (2) geographic features should be used to minimize the visual impacts of corridors and corridors, lines, and towers should not be placed on prominent geographic features, such as ridgelines and hilltops; and (3) placement and maintenance of utility lines should minimize the removal of vegetation and the disruption of views from public highways, trails, and waters. Buscher pf. at 4; exh. TDI-MB-2, appendix D.

75. The Project will comply with the above standards. The Project will be buried for one-half mile within the Bay Road ROW in Alburgh and then will be located beneath Lake Champlain as it traverses the counties within the northwest region. At TDI-NE's Alburgh property, undergrounding the cables from Bay Road to the lake will leave the land use undivided. Buscher pf. at 5.

76. The Project will comply with the general provisions of the Rutland and Southern Windsor County Regional Plans relevant to the overland route. Buscher pf. at 5; exh. TDI-MB-2.

77. The Project will comply with all of the relevant land-conservation measures in the plans for the towns along the overland route. Buscher pf. at 6; exh. TDI-MB-2.

78. Chittenden, Addison, Grand Isle, and Rutland counties have boundaries that extend to the New York border in Lake Champlain, and the Project will comply with all relevant and applicable provisions of the regional plans. Buscher pf. at 5.

79. There are no land-conservation measures in the lake-route towns that would apply to a project located in or on the lakebed of Lake Champlain. Buscher pf. at 6.

80. The Project has a single interconnection point at the existing Coolidge substation, and will not establish new facilities that could affect development patterns. Buscher pf. at 4; exh. TDI-MB-2.

81. The Project has the potential to reduce reliance on fossil fuels in the New England region. Jessome Panel pf. at 21, 64; Seth Parker, TDI-NE ("Parker") pf. at 50.

82. TDI-NE has committed to establishing "public good" funds in conjunction with the development of the Project, which will be used in part to benefit Lake Champlain. Jessome Panel pf. at 16, 22, 23-24; Jessome Panel supp. pf. at 5-6, 15-16.

Need for Present and Future Demand for Service

[30 V.S.A. § 248(b)(2)]

83. The Project is required to meet the need for present and future demand for service which could not otherwise be provided in a more cost-effective manner through energy conservation programs and measures and energy efficiency and load management measures. This finding is supported by findings 84 through 99, below.

Background

84. TDI-NE is a merchant developer, not a regulated distribution utility with retail customers, and the NECPL is a merchant transmission project. Jessome Panel pf. at 65-66; Parker pf. at 14.

85. The Project will help meet renewable energy and environmental policy goals, while helping to address problems associated with the impending retirement of power plants in the region and with the lack of fuel diversity. Jessome Panel pf. at 66.

Renewable Energy Policies

86. Each of the New England states has some form of a Renewable Portfolio Standard ("RPS") or a requirement that its electric utilities or load-serving entities procure a percentage of their energy supplies from qualified renewable resources. The NECPL will facilitate the delivery of low-carbon, renewable energy into New England. Parker pf. at 14.

Retirements and Fuel Diversity

87. Over the past few years, a number of large power plants in New England have retired or announced their intention to retire. ISO-NE estimates that up to 8,300 MW of non-gas-fired generation is "at risk" for retirement by 2020 in the form of 28 older oil and coal units. If all retire, ISO-NE estimates that 6,300 MW of new or re-powered capacity will be needed in the region. Parker pf. at 9-10.

88. The New England Governors issued the *New England Governors' Commitment to Regional Cooperation on Energy Infrastructure Issues*, dated December 2013, which includes the following statements:

> As the region's electric and natural gas systems have become increasingly interdependent, ensuring that we are efficiently using existing resources and securing additional clean energy supplies will be critical to New England's economic future. To ensure a reliable, affordable and diverse energy system, we need investments in additional energy efficiency, renewable generation, natural gas pipelines, and electric transmission.

Parker pf. at 15.

89. According to ISO-NE, "The future fuel mix of the region will show continued dependence on natural-gas-fired generation and the addition of intermittent renewable resources." The Generator Interconnection Queue is primarily comprised of gas-fired and wind plants. Parker pf. at 22; exh. TDI-SGP-2 at 102.

90. ISO-NE is concerned about the region's lack of fuel diversity. According to its 2014 Regional System Plan, "New England's capacity and electric energy production in 2013 indicates that the region is highly dependent on natural gas-fired generation and lacks a more balanced mix of oil, coal, nuclear, and hydro and other renewable resources." Parker pf. at 23.

91. Vermont's Comprehensive Energy Plan states, "Vermont utilities should continue to diversify their portfolios with appropriate mixes of renewable energy, through contract procurement and ownership of generating supply via both in-state and out-of-state sources… ." Parker pf. at 43; exh. TDI-SGP-6 at 67.

Renewable Energy Supply

92. TDI-NE plans to transmit electricity over the NECPL that is generated by renewable energy sources, virtually all of which will be located in Canada for the foreseeable future. Parker supp. pf. at 16.

93. The location of the NECPL's interconnection point with the Hydro Quebec system near the US-Canadian border enables NECPL to source renewable energy from Hydro Quebec and other provinces. Parker supp. pf. at 15.

94. TDI-NE anticipates that virtually all Canadian energy supplies for the NECPL will be renewable. Parker supp. pf. at 15.

95. Vermont's Comprehensive Energy Plan states that hydroelectric energy is stably priced and insulated from escalating fossil fuel prices. Hydroelectric and wind energy delivered via the NECPL would likely be bid into the ISO-NE energy market at prices that reflect their low marginal cost and would not be based on natural gas prices. Parker pf. at 16-17 and 24; exh. TDI-SGP-6 at 104.

96. Under the BED Stipulation, TDI-NE has agreed to provide BED with an opportunity to purchase up to 30 MW of unallocated transmission service on the NECPL for a term of 20 years, subject to applicable FERC requirements and other conditions specified in the stipulation. Exh. TDI-JMB-23 at 4.

97. TDI-NE and the DPS have agreed to the following CPG condition:

> Six months prior to the termination of the initial transmission service contracts for the Project, and subject to applicable FERC requirements, TDI-NE shall negotiate in good faith with the Vermont electric distribution utilities for up to 200 MW of transmission service on the NECPL for a term of up to 20 years. The price of such transmission service shall be determined at that time and shall be generally consistent with market prices; however, the price offered to Vermont utilities shall not exceed the price of transmission service for a contract of similar size and scope executed in the prior three years.

Exh. TDI-JMB-19a at 10-11.

98. TDI-NE proposes the following CPG condition regarding the confirmation of renewable energy suppliers:

> Prior to commencing construction, Petitioner shall file all contracts with transmission customers (energy suppliers) who will utilize the NECPL. The purpose of the filing shall be to confirm Petitioner's representations in its Petition that energy to be transmitted on the NECPL will be from hydro, wind, or other "renewable energy" sources, as defined under Vermont law. Petitioner may submit redacted versions of such contracts to protect pricing and other business confidential and trade secret information.

Exh. TDI-JMB-19a at 10.

99. TDI-NE will file all transmission service contracts for the NECPL with the Board as post-CPG compliance filings to confirm its representations that the energy to be shipped through the NECPL is "renewable energy" as defined under Vermont law. TDI-NE has further agreed to endeavor to obtain facility-specific information from its transmission customer(s) in order to track the source of energy shipped on the NECPL. Pursuant to the DPS/ANR/DHP Stipulation and the CLF Agreement, TDI-NE may submit redacted versions of such contracts to protect pricing and other business confidential and trade secret information. Exhs. TDI-JMB-19a at 10-11; TDI-JMB-20 at 4.

System Stability and Reliability

[30 V.S.A. § 248(b)(3)]

100. The Project will not adversely affect system stability and reliability. This finding is supported by findings 101 through 121, below.

101. Three categories of transmission facilities are required to reliably interconnect and operate the NECPL for delivering energy from Canada to New England:

i. The set of electrical components that comprise the NECPL itself. These transmission facilities will be directly designed, engineered, procured, constructed, financed, owned, and maintained by TDI-NE or its contractor(s).

ii. The modifications at VELCO's Coolidge substation that will be required to reliably interconnect the NECPL to the Vermont transmission system. These transmission

facilities will be designed, constructed, owned, operated, and maintained by VELCO or its contractor(s), pursuant to an interconnection agreement that will be executed between VELCO and TDI-NE.

iii. Any network upgrades to other portions of the Vermont or New England sub-transmission and transmission systems that are required to reliably interconnect and operate the NECPL. These transmission facilities will be designed, constructed, owned, operated, and maintained by the transmission owner whose facilities would otherwise be affected by the interconnection and operation of the NECPL.

Eng pf. at 6-7.

102. Using HVDC technology to transmit power from Quebec to New England has several advantages over HVAC technology. Those benefits include:

i. Significant advantages regarding transmission losses;

ii. The ability to be fully dispatchable by ISO-NE;

iii. The ability to provide or absorb up to +579 and -220 MVArs of reactive power; and

iv. The ability to contribute to the restoration of electric service to New England following a regional power outage.

Eng. pf. at 10-11.

103. ISO-NE would have day-to-day operational control of the Project facilities. Eng pf. at 13.

104. VELCO, the owner of the Coolidge substation, will enter an interconnection agreement with TDI-NE through which TDI-NE will agree to pay for the cost of modifying the Coolidge substation and equipment therein to reliably interconnect and operate the NECPL. Jessome Panel pf. at 24 and 66; Eng pf. at 14.

105. The NECPL interconnection is subject to review and approval by ISO-NE. A System Impact Study ("SIS") is expected to be completed in the second quarter of 2016. Jessome Panel supp. pf. at 19-20; Eng supp. pf. at 7-8.

106. The SIS includes several individual studies that examine the performance of the New England bulk power system under normal and contingency conditions. Those individual studies include a steady state analysis, thermal and voltage study, dynamic stability study, short circuit

study, and other studies that may be specific to the individual project under consideration (e.g., system protection and relaying studies). Eng pf. at 18.

107. A key objective of the SIS is to ensure that all elements of the bulk power system operate within their allowable ratings under normal and unexpected, or "contingency," system conditions. If the addition of a new generator or a new transmission element has the potential to cause any distant component of the transmission system to exceed its applicable rating during either normal or contingency system conditions, then an appropriate solution to that potential overload must be identified. Eng pf. at 15-16.

108. The specific list of network upgrades and anticipated direct interconnection facilities will be known once the SIS and any supplemental studies are completed. Eng pf. at 19; Eng supp. pf. at 8; exh. TDI-JMB-22.

109. In light of the information available to date, interconnection and operation of the NECPL should not result in an adverse impact on transmission system stability or reliability because mitigation measures can be developed to relieve overloads on critical transmission facilities, or the NECPL output could be modified by ISO-NE if necessary to ensure that the New England transmission system is operated in accordance with applicable reliability criteria. Eng. pf. at 21.

110. The reassessment of the NECPL under ISO-NE's new elective transmission upgrade ("ETU") process may eliminate the need for some of the upgrades identified in the prior draft System Impact Study or could identify a different set of upgrades. Eng supp. pf. at 7.

111. TDI-NE will be responsible for the capital and operating costs of the system modifications or upgrades, to the extent required by ISO-NE rules pursuant to the contemplated interconnection agreement between TDI-NE and the applicable transmission owner(s), that are necessary to interconnect the NECPL in a manner that does not adversely affect system stability and reliability. Jessome Panel pf. at 66; Eng pf. at 20.

112. Under the DPS/ANR/DHP Stipulation, TDI-NE agreed as follows:

> TDI-NE shall submit the final SIS and I.3.9 approval as soon as they are individually available. If the final SIS and I.3.9 approval are first available prior to the Board issuing a CPG for this project, then they shall be reviewed by the Board and Parties as part of this proceeding. If the final SIS and I.3.9 approval are not available at such time, TDI-NE and the Department agree that the CPG should be conditioned upon

> the Board review of each as a post-CPG compliance filing, subject to review and comment by the Department, VELCO, Green Mountain Power, and Burlington Electric Department regarding: (i) any issue germane to ongoing section 248(b)(3) compliance; or (ii) whether any identified subtransmission or transmission system upgrades require further review and/or approval by the PSB.
>
> The Parties agree that TDI-NE and/or the affected transmission system owners will initiate separate proceeding(s) under section 248, or section 248(j) as appropriate, for the transmission or subtransmission upgrades to be required in Vermont as a result of the NECPL. The Parties further agree that TDI-NE's pending Petition can be acted upon by the Board, subject to the condition that construction cannot commence until those collateral section 248 approvals for the transmission and subtransmission upgrades are obtained. All collateral transmission or subtransmission upgrades shall be reviewed independently under the applicable section 248 criteria and no party to this Stipulation waives any of its rights to participate in, or raise issues in connection with, those separate proceedings. The Parties recognize that in order for the Project to proceed to construction and for the benefit payments to commence, any collateral section 248 proceedings for transmission or subtransmission upgrades will need to be conducted as expeditiously as possible. The Parties agree to use their best efforts to facilitate an appropriate, efficient, and time-sensitive review process.
>
> TDI-NE agrees that it will be obligated to pay for all transmission system and subtransmission system upgrades that are necessitated due to the Project, (i) as determined by ISO-NE pursuant to the interconnection process administered by ISO-NE; and (ii) those additional subtransmission upgrades as determined by Vermont Utilities and TDI-NE and approved by the Board. To the extent that Vermont Utilities and TDI-NE disagree that the subtransmission upgrades are necessary as a result of the NECPL, the Vermont utilities and TDI-NE will bring the dispute to the PSB. The Parties recognize that these upgrades may be different than the preliminary list provided by TDI-NE to the Department, and may require further review of the NECPL under PSB rules regarding amendments to a section 248 Petition if the upgrades materially change any finding or conclusion reached by the Board. TDI-NE cannot commercially operate the Project until the subtransmission mitigation measures are in service.

Exh. TDI-JMB-19a at 8-8.

113. VELCO owns "PV20," an existing set of transmission cables traversing Lake Champlain, and is preparing to remove and replace the existing PV20 cables. TDI-NE and VELCO have entered a stipulation ("VELCO Stipulation") through which TDI-NE and VELCO agree that, provided TDI-NE fulfills the terms of the VELCO Stipulation and the VELCO Agreement, as

amended, the Project will not adversely impact the PV20 Project. TDI-NE and VELCO further agree to the following CPG condition concerning PV-20:

> TDI-NE and VELCO (and other utilities if applicable) shall consult and coordinate regarding those aspects of the Project and those aspects of the existing PV20 installation and the PV20 Project brought about by the need to accommodate the crossing of the cables (the "Works") and will create a working group for this purpose, such group to meet on a regular basis and to consist of appropriate engineering and project management personnel empowered to make decisions pertaining to the Works on behalf of TDI-NE and VELCO (and other utilities if applicable).
>
> TDI-NE shall construct, maintain, repair, and operate the Project in accordance with Good Utility Practice and avoid causing construction delays or other adverse impacts to the PV20 Project.
>
> TDI-NE shall construct the Project in a manner that allows the safe and efficient removal of the existing PV20 and its replacement in its entirety, i.e., by employing for this purpose an underwater bridge or bridges or an alternative design that VELCO (and other utilities if applicable) agrees will provide a similar level of protection, at Petitioner's cost.
>
> TDI-NE shall reimburse VELCO (or its designee) for all reasonable costs it (or its designee) incurs in connection with its obligations set forth in paragraph 2.a(i) above, including, without limitation, its review of TDI-NE's Project plans.
>
> TDI-NE and VELCO will cooperate to minimize costs related to construction, maintenance, and/or repair of the Works. TDI-NE will reimburse VELCO (and its designee, if applicable) for all reasonable costs attributable to TDI-NE's actions or inactions that are incurred by VELCO (or its designee) in connection with the removal of the existing PV20 and the construction, maintenance, and repair of the proposed PV20 Project; provided, however, that in the event that the need to perform repair, removal, or maintenance activities regarding the new PV20 is caused by the alleged negligence or other legally culpable act or omission of a third party, TDI-NE shall not be required to make the reimbursements required above if VELCO has been indemnified pursuant to contracts of insurance or other risk-sharing arrangements, which arrangements VELCO shall make commercially reasonable efforts to secure prior to commencement of the PV20 Project. Upon occurrence of such negligence or other legally culpable act or omission of a third party, VELCO will advise TDI-NE of such occurrence in a timely fashion and will pursue the claim of indemnity in due course, consulting with TDI-NE as appropriate.
>
> TDI-NE shall indemnify and hold harmless VELCO and any other project owner for any physical damage that the Project causes to the existing and proposed PV20 installation and will hold harmless and indemnify and (at VELCO's option) defend

> VELCO against any third party claims of any nature whatsoever arising out of the Project, and VELCO will hold harmless and indemnify and (at TDI-NE's option) defend TDI-NE against any third party claims of any nature whatsoever arising out of the existing or proposed PV20 installation.

Exh. TDI-JMB-21.

114. Under the GMP Stipulation, TDI-NE and GMP agree that, provided TDI-NE fulfills the terms of the Stipulation, the Project will promote the general good and otherwise meet the criteria of section 248(b)(3) and (b)(10). In addition, TDI-NE and GMP agree:

> The Project may have adverse impacts on system stability and reliability (including impacts on GMP's subtransmission system) which have not yet been identified in the SIS.
>
> To collaborate during the SIS process to facilitate the review of appropriate components of Vermont's subtransmission system in light of the fact that ISO-NE cannot recognize Vermont's lower voltage subtransmission system (69 kV, 46 kV and 34.5 kV) in its real-time monitoring system, and therefore, will not know when a potential adverse impact is threatening Vermont's subtransmission system. The Parties further agreed that GMP should be involved in the SIS process.
>
> To collaborate with respect to design and implement in a timely fashion any mitigation strategies or system upgrades ("SIS Mitigation Measures") necessary or required to avoid adverse effects on the reliability and stability of the GMP electric system as a result of contingencies identified in the SIS or in any supplemental studies.

Exh. TDI-JMB-22.

115. The GMP Stipulation provides additional detail concerning the review of the Project's potential impacts on the transmission and subtransmission systems, both within the ISO-NE's SIS process or supplemental to it, as well the remediation of impacts on GMP's subtransmission system, if any, at TDI-NE's expense. Exh. TDI-JMB-22.

116. Separate governmental approval(s) may be required under Section 248 or other state or federal regulatory programs for upgrades to subtransmission or transmission systems in Vermont that are required as a result of the NECPL. Exh. TDI-JMB-22.

117. Under Paragraph 6 of the GMP Stipulation, TDI-NE and GMP agree that TDI-NE's pending Petition can be acted upon by the Board, subject to the condition that construction cannot commence until such collateral Section 248 approvals for the transmission and

subtransmission upgrades are obtained. Further, the Project cannot be commissioned until all SIS mitigation measures or supplemental subtransmission mitigation measures have been implemented at TDI-NE's cost. Exh. TDI-JMB-22.

118. Under Paragraph 6 of the GMP Stipulation, TDI-NE agrees to prepare all necessary application materials on GMP's behalf and subject to GMP's approval. GMP agrees to file and seek approval of all such petitions and applications within a reasonable time period, taking into account TDI-NE's Project schedule, which shall be provided to GMP by TDI-NE in a timely fashion. TDI-NE shall be responsible for all reasonable costs incurred by GMP for such regulatory proceedings, with periodic invoices to be provided to TDI-NE in a timely fashion. Exh. TDI-JMB-22.

119. Under Paragraph 9 of the GMP Stipulation, TDI-NE has agreed to the following CPG conditions:

> TDI-NE shall comply with the terms of the GMP Stipulation.
>
> If the final SIS and I.3.9 approval are not available prior to issuance of the CPG, TDI-NE shall submit the final SIS and I.3.9 approval to the Board for review prior to commencement of construction. In addition, if a Supplemental Subtransmission Study is prepared, TDI-NE shall file the final version of the study with the Board prior to the filing of GMP's 248 petition(s) as set forth in Paragraph 5 of the GMP Stipulation.
>
> TDI-NE shall be obligated to pay for all costs reasonably incurred by GMP to implement the GMP Stipulation including but not limited to the costs of the SIS Mitigation Measures, the Supplemental Mitigation Measures, the SIS and SIS Mitigation Process, and the Supplemental Subtransmission Study Process. TDI-NE shall reimburse GMP for any and all costs it reasonably incurs in implementing the GMP Stipulation including the hourly cost of employees, consultants, and reasonable expenses.
>
> The Project shall not be commissioned until all SIS Mitigation Measures or Supplemental Subtransmission Mitigation Measures have been implemented at TDI-NE's cost.
>
> TDI-NE shall, in accordance with good utility practice, cooperate and coordinate with GMP and other affected Vermont electric distribution, transmission and subtransmission system owners, if any, during pre-construction and construction to mitigate and minimize any adverse impacts to GMP's facilities, customers, employees, and contractors, including but not limited to outages (which shall only

be taken as a matter of last resort), facility relocations and impacts to GMP's ability to reliably and safely serve its customers.

Prior to construction of the Project, TDI-NE shall undertake a process with GMP in which they will review on the ground and via detailed Project plans the entire overland Project where it coincides with GMP's facilities. During this process, all areas of potential adverse impacts to GMP's facilities, customers, and ability to reliably and safely serve those customers shall be identified and a mutually agreed upon Work Plan shall be developed by the parties in accordance with good utility practice. The Work Plan shall identify how each and every identified impact will be mitigated or avoided. Such mitigation measures include but are not limited to minimizing to the fullest extent possible outages to GMP customers, ROW acquisition, facility relocations, and alternative construction procedures. All reasonably incurred costs of the process, Work Plan, and mitigation measures shall be paid for by TDI-NE including any reasonably incurred costs for GMP employees, consultants, contractors, and expenses.

TDI-NE shall, in accordance with good utility practice, cooperate and coordinate with GMP and other affected Vermont electric distribution, transmission and subtransmission system owners, if any, to ensure that operation of the Project does not cause adverse impacts to their distribution, transmission and subtransmission systems, provided, however, that TDI-NE shall at all times operate the Project in a manner that is consistent with ISO-NE's operating instructions. TDI-NE shall follow good utility practice and dig safe provisions in the maintenance and operation of the Project. Prior to undertaking any maintenance of the Project, TDI-NE shall determine whether GMP facilities or customers may be impacted and provide reasonable advance notice of such maintenance. For any such maintenance, TDI-NE shall work with GMP to develop a mutually agreed upon Maintenance Plan subject to good utility practice to perform such maintenance in a manner that mitigates or avoids impacts to GMP's facilities, customers, or ability to safely and reliably serve such customers. Any and all reasonably incurred costs of such Maintenance Plan and mitigation measures shall be paid by TDI-NE including but not limited to reasonably incurred costs of GMP's employees, contractors, and consultants plus expenses.

If, after construction of the Project, it is determined that there are adverse impacts attributable to the Project to GMP's facilities, customers or ability to safely and reliably serve its customers that could not have been reasonably foreseen prior to construction, TDI-NE and GMP shall work collaboratively and subject to good utility practice, to mitigate such impacts at Petitioner's sole expense.

Exh. TDI-JMB-22.

120. Under the BED Stipulation, TDI-NE and BED agree that, provided TDI-NE fulfills the terms of the stipulation, the Project will promote the general good and otherwise meet the criteria of section 248(b)(3) and (b)(10). In addition, TDI-NE and BED agree that:

> The Project may have adverse impacts on system stability and reliability (including impacts on Vermont's transmission and subtransmission system) which have not yet been identified in the SIS.
>
> So long as BED is allowed to participate in any SIS process associated with the Project and the terms and conditions of the GMP Stipulation and DPS Stipulation regarding the SIS process are incorporated into a CPG, issues raised by BED with regard to system impacts to Vermont's transmission system are satisfactorily addressed by TDI-NE with respect to the section 248 proceeding.
>
> The protections extended to GMP in Section 5 of the GMP Stipulation will apply to, in addition to VELCO and GMP, all other electric load-serving utilities in Vermont.

Exh. TDI-JMB-23.

121. Based on the stipulations referenced above, TDI-NE has proposed the following additional CPG conditions:

> Prior to commencing construction, Petitioner shall submit the final System Impact Study and I.3.9 approval to the Board for review, and to the Department, VELCO, GMP, and BED for review and comment.
>
> Prior to commencing commercial operation of the Project, Petitioner shall make a compliance filing demonstrating that all SIS Mitigation Measures or Supplemental Subtransmission Mitigation Measures as provided for under the GMP Stipulation have been implemented at Petitioner's expense.
>
> Petitioner shall be responsible for the costs of the transmission system and subtransmission system upgrades in Vermont that are necessary in order to address adverse impacts to system stability and reliability due to the Project, as determined by ISO-NE pursuant to the interconnection process administered by ISO-NE and as determined pursuant to any supplemental subtransmission study performed pursuant to the GMP Stipulation.

Exh. TDI-JMB-23

Economic Benefit to the State

[30 V.S.A. § 248(b)(4)]

The Project will result in an economic benefit to the state and its residents. This finding is supported by findings 122 through 144, below.

Public Good Benefit Payments

122. As reflected in TDI-NE's original Petition and as modified under the DPS/ANR/DHP Stipulation, CLF Stipulation, VELCO Agreement, GMP Stipulation, BED Stipulation, and Benson Agreement, TDI-NE is obligated to make payments that will provide economic benefits to Vermont residents and ratepayers. Jessome Panel pf. at 22-24; Jessome Panel supp. pf. at 16; TDI-JMB-6 (revised).

123. TDI-NE has proposed four categories of public good benefits:

i. VT Electric Ratepayer Benefit: Annual payments to VELCO for 40 years. VELCO will facilitate the disbursement of the TDI-NE annual payments to the Vermont electric distribution utilities for the benefit of Vermont ratepayers.

ii. VT Renewable Programs: Annual contributions to the Clean Energy Development Fund to enhance in-state renewable energy programs for average-income Vermonters.

iii. Lake Champlain Pollution Abatement and Restoration Fund: Annual contributions to the newly announced Clean Water Fund established by 10 V.S.A. § 1388, to be directed towards addressing excess phosphorous in Lake Champlain and other uses related to the Lake Champlain watershed.

iv. Lake Champlain Enhancement and Restoration Trust Fund: Annual contributions to a fund to be created to restore and enhance aquatic habitat and improve recreational access to or opportunities in Lake Champlain. The Fund will be administered by a diverse group of Lake Champlain-based stakeholders in the public, private, and non-profit sectors.

Jessome Panel pf. at 22-24; Jessome Panel supp. pf. at 16; exhs. TDI-JMB-7, JMB-7a, and JMB-19a.

124. The sole purpose of TDI-NE's payments to VELCO is for those payments to then be transferred to the Vermont electric distribution utilities for the benefit of their ratepayers. The administration of the payments is addressed in the First Amendment to the VELCO Agreement:

> VELCO will establish a special class of stock (directly or through a special purpose entity) in order to receive and distribute the quarterly payments to be made by Petitioner to the DUs for the benefit of their ratepayers, contingent on receipt of necessary approvals from the VELCO Board of Directors. The DUs shall be the owners of such stock with their respective ownership in proportion to each DU's load

> ratio share, in order to ensure an equitable distribution of benefits among Vermont ratepayers. VELCO shall distribute the TDI-NE quarterly payments (less any required taxes and administration costs) to the DUs as stock dividends on a quarterly basis, for the benefit of their ratepayers as required by the Agreement. VELCO and TDI-NE understand that the distributions would be credited by the DUs as revenues in their cost of service calculations. In the event that the VELCO Board of Directors fails to issue the necessary approval(s) in accordance with the above, VELCO shall propose a new payment arrangement to implement Paragraph 1 of the VELCO Agreement, subject to consent from TDI-NE and amendment of the Agreement.

Exh. TDI-JMB-7a.

Other Direct Payments by the NECPL

125. TDI-NE will be making payments to other state or local entities, as follows:

i. TDI-NE will make payments to the Town of Benson of $550,000 at the time of the Project's financial closing and $550,000 at commencement of commercial operation to assist Benson in purchasing road equipment and infrastructure that will allow for the maintenance of roads and provide emergency services. Jessome Panel supp. pf. at 12; Singer supp. pf. at 4; exh. TDI-JMB-24b at 2.

ii. TDI-NE has entered into a license agreement with the Vermont Fish and Wildlife Department ("VFWD") that allows TDI-NE to use the Korean War Veterans Access Area located in Alburgh, Vermont, to perform part of the HDD installation of the Project in Lake Champlain. Under the license TDI-NE will pay $350,000 for VFWD to construct a public boat ramp at this access area. Jessome Panel supp. pf. at 15; Singer supp. pf. at 4; exh. TDI-JMB-26 at 1.

iii. TDI-NE has entered into a Lease Option Agreement with VTrans that provides for annual lease payments for TDI-NE's use of state highway and railroad rights-of-way, amounting to $211.8 million over the three-year construction period and 40-year operational period. Jessome Panel supp. pf. at 13-15; Singer supp. pf. at 7-8; exh. TDI-JMB-25.

iv. TDI-NE has agreed under the BED Stipulation to provide funding to BED, up to $750,000 and subject to certain conditions, to study and/or develop a commercially viable generation solution in the BED service territory, or in a surrounding community,

that meets the dual goals of producing local renewable energy and aiding in the cleanup of Lake Champlain. Exh. TDI-JMB-23 at 3-4.

v. TDI-NE will make property tax payments to Alburgh, Benson, Castleton, Cavendish, Clarendon, Fair Haven, Ira, Ludlow, Mount Holly, Rutland, Shrewsbury, Wallingford, West Haven, and West Rutland for hosting the overland portion of the Project in state or town rights-of-way. TDI-NE will pay a total of $274.2 million in property taxes in Vermont over the course of construction and operation of Project. Jessome Panel supp. pf. at 11-13, 16; Singer supp. pf. at 5-7; exhs. TDI-TS-3 (revised.) and TS-5.

vi. Corporate income taxes and sales taxes in the amounts of $414.4 million and $31.4 million, respectively. Singer supp. pf. at 7; exh. TDI-TS-3 (revised).

Power Market Impacts and Ratepayer Savings

126. TDI-NE is expected to sell transmission rights at negotiated rates through an open solicitation process that would allow transmission customers to utilize NECPL's line capacity to offer and deliver electrical energy into the ISO-NE wholesale energy market. These shippers are expected to utilize hydroelectric or other renewable generation in Canada in order to offer and bid into the ISO-NE energy markets. Parker pf. at 25-26.

127. TDI-NE conducted a set of integrated analyses to estimate the Project's impacts on Vermont and New England that included: (a) forecasting the reduction in wholesale energy prices using a dispatch simulation model; (b) estimating the reduction in wholesale capacity prices; (c) addressing possible market responses to the NECPL; and (d) calculating the consequential reduced bills for typical Vermont and New England residential ratepayers. The forecasts covered the first ten years of the NECPL's expected operations, from April 2019 through March 2029. Parker pf. at 6, 24-26.

128. A high percentage of Vermont's energy and capacity requirements is obtained through contracts and power plant ownership. According to the 2011 Comprehensive Energy Plan, "…the aggregate supply of committed contracts or generation units (as opposed to open market purchases) has provided 85% to 90% of Vermont's energy needs over the last several years, of which 55% to 60% has been from Vermont-based resources." Parker pf. at 41.

129. The NECPL's impact on Vermont ratepayers depends on their exposure to wholesale market energy and capacity prices. Long-term contracts tend to insulate ratepayers from swings in wholesale prices, while short-term contracts tend to reflect known and anticipated wholesale market prices. Ratepayers would be further insulated from wholesale price swings to the extent Vermont's utilities have ownership in power plants. Parker pf. at 40-42.

130. TDI-NE's analysis of projected energy and capacity prices assumed that 25% of Vermont's power needs would be hedged in long-term contracts and that ratepayers would receive 75% of the wholesale energy and capacity price reductions due to the NECPL. The analysis also included an assumption of a 50% hedge and no hedge. Parker pf. at 31 and 44; Parker supp. pf. at 17.

131. The NRCPL is estimated to reduce wholesale energy prices (2014 dollars using a 2% long-term inflation rate) by: (a) a load-weighted average of $2.48 per MWh, or 6.0%, in Vermont; and (b) an average of $1.04 per MWh, or 2.5%, in New England. Parker pf. at 28.

132. The total wholesale energy price savings in New England is estimated to be approximately $1.591 billion. The total energy price savings for Vermont ratepayers is estimated to be $178.5 million assuming no hedging, $133.9 million assuming 25% hedging, and $89.2 million assuming 50% hedging. Parker pf. at 29; Parker supp. pf. at 2-3 and 19.

133. The NECPL will enable up to 1,000 MW of capacity to be delivered into ISO-NE. To estimate the capacity savings of the Project, TDI-NE assumed that only 500 MW of capacity would be delivered into the Forward Capacity Market. Parker pf. at 34-35.

134. Wholesale capacity prices are estimated to decline by an average of $0.64 per kW-month (2014 dollars) in New England. The total capacity price savings in New England are estimated to be approximately $2.693 billion. The total capacity price savings for Vermont ratepayers is estimated to be $101.2 million assuming no hedging, $75.9 million assuming 25% hedging, and $50.6 million assuming 50% hedging. Parker pf. at 38; Parker supp. pf. at 4 and 19.

135. The NECPL may have economic benefits with respect to the ancillary services market in New England (i.e., reserves, reactive power support, and regulation). The prices for these services are likely to decline but were not quantified. Parker pf. at 31-32.

136. The NECPL is expected to be commercially operational for many decades, well beyond the ten-year study period. During this time, some of Vermont's long-term contracts will expire, some owned resources will retire, and some resource entitlements will end. Any of these eventualities would reduce Vermont's long-term hedges and potentially enable Vermont ratepayers to benefit more from the wholesale energy and capacity price reductions due to the NECPL. Parker supp. at 19.

Total Economic Benefits

137. The total direct economic benefit of the Project in Vermont during the construction and commercial operation periods is estimated to be approximately $1.935 billion. This benefit includes $509 million in public good benefits, $900 million in taxes and required lease payments, $215 million in direct spending during construction, and $309 million in direct spending during operation. Singer supp. pf. at 3-5, 9; Kavet supp. pf. at 2-3; Parker supp. pf. at 19; exhs. TDI-TS-2 (revised), TDI-TS-3 (revised), and TDI-TS-4 (revised).

138. Under the DPS/ANR/DHP Stipulation, the Parties acknowledge that the Project may operate beyond the 40-year period that TDI-NE has estimated based upon the manufacturer's warranty, understanding that the CPG will not have an expiration date. The Parties further acknowledge that the benefit payments:

> are being or may be used in several regulatory obligations of TDI-NE which are necessary for the completion of this Project. The Parties further acknowledge that the benefit fund payments due under this Stipulation are for a term of forty years, after which the Parties agree to negotiate in good faith regarding whether any additional payments are appropriate and if so in what amount and amendments to this Stipulation, subject to PSB review and approval.

Exh. TDI-JMB-19a at 6

139. Under the DPS/ANR/DHP Stipulation, the Parties agree to the following proposed CPG condition:

> No later than January 1st of the 37th year of commercial operation of the Project, Petitioner shall enter into discussions with ANR and the DPS, and shall negotiate in good faith, regarding continued payment of public good benefits and/or other amendments to the Stipulation (dated July 17, 2015) in the event commercial operation of the Project extends beyond the 40th year. No later than January 1 of the

> 39th year of commercial operation of the Project, Petitioner shall file with the Board for review and approval a plan regarding the extension of benefit fund payments beyond the 40th year of commercial operations. In the event this plan does not reflect an agreement reached with ANR and DPS, Petitioner shall provide an explanation of the efforts it made to engage in good faith negotiations, and the Board shall open a docket and establish a schedule to determine: (i) whether continued public good benefits are appropriate; and (ii) a plan for the continued payment of public good benefits if determined appropriate. Petitioner, ANR and DPS shall automatically be parties to the docket. Petitioner shall be authorized to continue to operate the Project beyond the 40th year during and after the proceedings concerning the public good benefits, provided that if payment of public good benefits ultimately are approved by the Board they shall be applied retroactively beginning in the 41st year of operation of the Project.

Exh.TDI-JMB-19a at 11-12.

Economic Impact Analysis

140. TDI-NE performed an economic impact analysis of the NECPL on the six New England states, including Vermont. The economic analysis used a New England regional economic model prepared by Regional Economic Models, Inc. ("REMI"). REMI offers one of the more sophisticated regional economic models for impact analysis. The model is well-documented, regularly updated, and has been widely used in Vermont and the nation, including use by the Department. The REMI analysis included: (a) direct project construction and operational expenditures; (b) public benefit expenditures under the DPS/ANR/DHP Stipulation, VELCO Agreement, VTrans Lease Option, F&W License, and Benson Agreement; and (c) electricity price input. Kavet pf. at 3-9; Kavet supp. pf. at 2-3.

141. The REMI analysis showed that construction and operation of the Project will bring significant economic benefits to the State of Vermont. These benefits are estimated to be:

Benefit	Region	Construction Period 2016-2018	Initial Operation Period 2019-2028
Total Employment	Vermont	552 jobs	285 jobs
	New England	779 jobs	2,212 jobs
Gross State Product	Vermont	$43.40 million	$39 million
	New England	$69.5 million	$361.6 million
Electricity Cost Savings	Vermont		$16.3 million
	New England		$187.4 million
State and Local Tax Revenues and Other Public Benefit Payments	Vermont	$21.6 million	$28.9 million

Exh. Kavet Supp. Pf. At 7, updated table 1.

142. In addition to the measured direct and secondary impacts from these expenditures, there are future public benefits not included in the economic impact analysis that relate to the value of reduced pollution in Lake Champlain (such as enhanced tourism spending, property values on and near the lake, etc.), improved recreational access and facilities in and around Lake Champlain, and the benefits of Clean Energy Development Fund activities, including reduced greenhouse gas emissions, greater power production diversity, and compliance with renewable energy goals. Kavet supp. pf. at 3.

143. TDI-NE has proposed the NECPL as a privately-financed merchant facility. That is, TDI-NE does not intend to seek to recover the costs of the Project through charges paid by retail electric ratepayers. Rather, it will recoup its costs of construction and operation through the payments it will receive from power suppliers who will contract to utilize capacity on the NECPL transmission line. Jessome Panel pf. at 17.

144. Should the situation change and the Project be funded through the FERC Order 1000 process, or another regional cost-sharing mechanism, the First Amendment to the VELCO Agreement provides as follows:

> TDI-NE shall indemnify Vermont's regionally allocated share of the costs to ensure that the net benefit identified in Schedule I of the VELCO Agreement accrues to Vermont's retail electric customers, by making additional payments to Vermont

> Transco LLC. Vermont Transco LLC or the Special Purpose Entity shall distribute these additional funds in accordance with Paragraph 1 and the other relevant provisions of the VELCO Agreement. In the event that the FERC Order 1000 process or another regional cost sharing mechanism is utilized and for so long as Project costs are being recovered by such process or mechanism, these additional indemnification payments shall not be suspended. Paragraphs 5 and 6 of the VELCO Agreement shall apply to these payments. TDI-NE will not seek cost recovery for these additional indemnification payments whether under the ISO-NE Tariff or any other cost sharing mechanism that allocates costs to Vermont ratepayers.

Exh. TDI-JMB-7a.

Aesthetics, Historic Sites and Water Purity, the Natural Environment, and Public Health and Safety
[30 V.S.A. § 248(b)(5)]

145. The Project will not have an undue adverse effect on aesthetics, historic sites, air and water purity, the natural environment, the use of natural resources, or the public health and safety, with due consideration being given to the criteria specified in 10 V.S.A. § 1424a(d) and § 6086(8a)(1) through (8) and (9)(K) and greenhouse gas impacts. This finding is supported by findings 146 through 396, below.

146. TDI-NE has entered into a comprehensive stipulation with ANR acknowledging that the review process for the underlying ANR permits is ongoing; however, based upon currently available information in the Petition and in the ANR permit applications, ANR agreed that the NECPL will not have an undue adverse effect under section 248(b)(5), provided that:

> TDI-NE submits all ANR permits that have not been issued at the time the Board issues a CPG as post-CPG compliance filings prior to commencement of construction. Submission of such permits shall be for notice purposes only and shall not give rise to further review or proceedings by the Board provided that such permit or permits do not require any material or substantial changes to the Project that have not yet undergone Board review.
>
> TDI-NE agrees to the Project changes and CPG conditions specified in Attachment II of the DPS/ANR/DHP Stipulation.

Exh. TDI-JMB-19a at 8.

147. Attachment II of the DPS/ANR/DHP Stipulation addresses ANR's collateral permits, and issues raised by ANR in its prefiled testimony concerning rare, threatened, or endangered wildlife

and plant species (including bats), fisheries, invasive plant species, floodplains and river corridors, construction and operation in Lake Champlain, blasting Best Management Practices ("BMPs"), greenhouse gases, and waste management/hazardous materials. TDI-NE has responded to ANR's concerns through revised or new environmental plans, Project design modifications, new or revised ANR permit applications, seasonal restrictions on in-lake construction, revised construction techniques, and greenhouse gas ("GHG") reporting. Jessome Panel supp. pf. at 4; exh. TDI-JMB-19a, Attachment II at 1-9.

148. Attachment II of the DPS/ANR/DHP Stipulation provides a process for ANR to review changes to the Project plans, as well as a process for ANR's review of any plans or other documents required under the stipulation. Jessome Panel supp. pf. at 4; exh. TDI-JMB-19a at 12.

149. The US Department of Energy ("DOE") released the Draft Environmental Impact Statement ("DEIS") in May 2015. According to the DOE's publicly available schedule, the Final Environmental Impact Statement is expected to be issued in October 2015 and the Record of Decision before the end of 2015. Jessome Panel supp. pf. at 17-18; exh. TDI-JMB-11 (revised).

150. The USACE deemed the Section 404 and Section 10 applications submitted by TDI-NE complete and issued a public notice for the Project on July 21, 2015. According to the notice, the comment period for the Project ended on August 21, 2015. TDI-NE understands that the USACE has all the information it requires to issue Sections 404 and 10 permits for the Project before the end of 2015. Jessome Panel supp. pf. at 17-18; exh. TDI-JMB-11 (revised).

151. Based on changes to ANR's regulatory authority earlier this year, a Floodplain Permit is now required for the Project. Further, based on consultation with ANR, it was determined that a Discharge Permit will not be required for the Project, as any lake-related discharges from the Project will be regulated under the Section 401 Water Quality Certificate program. The Floodplain Permit application and all other ANR applications previously identified have been submitted to ANR. Specific ANR comments on various applications have been addressed by TDI-NE. Jessome Panel supp. pf. at 18; exh. TDI-JMB-11 (revised).

152. During the development of the DPS/ANR/DHP Stipulation, ANR recommended that a Takings Permits be obtained prior to construction along discrete sections of the Project route where threatened or endangered reptiles may be present. Jessome Panel supp. pf. at 18.

153. TDI-NE has incorporated numerous environmental mitigation measures into the Project, as reflected in its prefiled direct testimony, supplemental testimony, exhibits, and as summarized in the revised mitigation table. Exh. TDI-JMB-14 (revised).

Outstanding Resource Waters

[10 V.S.A. § 1424a(d)]

154. None of the Project lands are within the vicinity of watersheds of classified outstanding resource waters. Therefore, the NECPL will have no impact on outstanding resource waters. Jeffrey Nelson, TDI-NE, ("Nelson") pf. at 9-10; Exh. TDI-JAN-2.

Air Pollution and Greenhouse Gas Impacts

[30 V.S.A. § 248(b)(5); 10 V.S.A. § 6086(a)(1)]

155. The Project will not result in undue air pollution. This finding is supported by findings 156 through 168, below.

156. Fugitive dust emissions from earth disturbance during construction of the terrestrial portion of the NECPL will be reduced through the implementation of the site-specific Erosion Prevention and Sediment Control ("EPSC") plan by Project contractors. While the specific BMPs to be employed will be the subject of an Individual Discharge Permit for Stormwater Runoff from Construction Sites ("Construction Stormwater Permit"), it is anticipated that dust-control measures will include, at a minimum, watering of disturbed areas as needed and prompt stabilization/restoration. Jessome Panel pf. at 70.

157. Construction of the Project will involve the use of large vehicles and vessels with diesel-powered internal combustion engines that may emit pollutants associated with such engines, but these emissions are not expected to exceed the *de minimis* thresholds established in 40 C.F.R. § 93.153(b) for individual nonattainment pollutants. If at any time these thresholds are

exceeded or permits are otherwise required for any associated air emissions, the appropriate permits will be obtained. Jessome Panel pf. at 70.

158. For the aquatic portion of the NECPL, the sources of air pollution associated with construction would be primarily diesel-powered internal-combustion engines. Heavy equipment, barges, generators, and vessels would emit pollutants such as carbon monoxide, carbon dioxide ("CO_2"), sulfur oxide, particulate matter, nitrogen oxide, and volatile organic compounds. During operation of the aquatic portion of the Project, the only impacts on air quality would be emissions from maintenance-related equipment, which are expected to be *de minimis*. Murphy pf. at 16-17.

159. All emissions associated with aquatic cable installation would occur during an approximately one-year construction season, although actual installation would only occur during approximately 1/3 of that year. Emissions associated with this work are expected to be *de minimis*. If required, air permits will be obtained for any of the equipment utilized for in-lake installation work. Murphy pf. at 17.

160. The ongoing operation of the overland portion of the NECPL will not generate air pollutants. Accordingly, operation of the Project will not require an air pollution control permit from ANR, with the possible exception of a permit for the emergency diesel generators to be located at the converter station. Jessome Panel pf. at 71; exh. TDI-JMB-9.

161. The final selection of equipment for the Project will not occur until the final post-CPG design stage. At that time, if required, TDI-NE will apply for and obtain any air permits for the generators. Jessome Panel pf. at 71.

162. Through the DPS/ANR/DHP Stipulation, TDI-NE agreed to the following conditions with respect to the use of circuit breakers containing SF_6:

> TDI-NE shall take commercially reasonable efforts to procure circuit breakers that do not contain SF_6. If non SF_6 breakers are identified that are suitable for the Project, TDI-NE shall consult with ANR prior to procurement to confirm that the greenhouse gas-related impacts would be reduced and that there are no other known unacceptable environmental impacts associated with the alternative.
>
> In the event that SF_6-containing breakers or other equipment are utilized, TDI-NE shall participate in the US EPA's SF_6 Emissions Reduction Partnership for Electric Power Systems on an ongoing basis while the breakers or other equipment are

> present. Copies of reports provided to the US EPA shall also be provided to ANR. TDI-NE shall develop and implement best practices in circuit breaker installation, operation, maintenance, and decommissioning to prevent and minimize releases of SF_6 to the atmosphere. TDI-NE shall utilize state-of-the-art SF_6 monitoring systems (e.g., temperature- compensated gauges to minimize measurement discrepancies, etc.) to accurately monitor the condition of the breakers and automatically be alerted to SF_6 leaks.

Exh. TDI-JMB-19a, Attachment II.

163. The energy to be shipped over the NECPL will displace the generation of equivalent energy from fossil-fuel-fired plants in New England and is expected to result in significant reductions in air emissions. Jessome Panel pf. at 71; Parker pf. at 47.

164. Hydroelectric projects have a long-term net GHG footprint. Studies show that there is a net increase in GHG emissions resulting from reservoir creation when accounting for CO_2 and methane produced or absorbed by the natural ecosystems within the watershed and that the net GHG emissions are highest in the first few years after flooding but subside and levelize over time. Parker pf. at 49; exh. TDI-SGP-13.

165. CO_2 reductions due to the NECPL could be partially offset by CO_2 emissions caused by hydroelectric projects. Parker pf. at 48-50; exh. TDI-SGP-13.

166. Field measurements and other estimates of net GHG emissions associated with hydropower projects vary, depending on the location of the reservoir, the ecosystem of the watershed, the annual energy output of the hydropower plant, and other factors. There is no standardized method for accounting for the GHG footprint of hydropower projects. Parker pf. at 50-51.

167. TDI-NE estimated that the annual average CO_2 equivalent ("CO_2eq") emissions displaced by the NECPL of approximately 3.3 million tons could be offset by 0.6 million tons of CO_2eq attributable to hydropower reservoir sources in Canada. This illustration did not specifically calculate the emissions attributable to the energy delivered via the NECPL because the exact energy mix has not yet been determined. Moreover, there are site-specific factors in determining the GHG footprint of a specific hydroelectric project, as discussed in previous findings. Parker pf. at 51.

168. Through the DPS/ANR/DHP Stipulation, TDI-NE agreed to the following reporting process regarding the type of energy shipped by the Project:

> On an annual basis, TDI-NE shall submit a report to the VT PSB that will summarize the amount of megawatt hours shipped on the line. TDI-NE shall provide the Agency with a copy of this report at the same time it is submitted to the Public Service Board. In addition to complying with Section 7(o) of the Stipulation (Confirmation of Renewable Energy), TDI-NE shall provide the Agency, and include in this report, the following information related to the energy shipped on the line: (1) the country of origin; (2) the annual throughput on the Project in megawatt hours, by producer; and (3) for each producer, their generation portfolio percentages by category (e.g. wind, hydro, etc.) for the report period year. The report will be due March 1 of each year the Project is operational, commencing after the first year of operation.

Exh. TDI-JMB-19a.

Water Purity and Water Pollution

[30 V.S.A. § 248(b)(5); 10 V.S.A. § 6086(a)(1)]

The NECPL will not have an undue adverse impact on water purity or result in undue water pollution. This finding is supported by findings 169 through 219, below.

Overland Route

169. The overland portions of the NECPL are being designed in coordination with VTrans and ANR to identify natural resource features and develop construction practices intended to prevent undue adverse impacts on water resources. Where necessary, HDD will be used in lieu of open trenching to avoid impacts on wetlands and water bodies. Detailed, site-specific EPSC measures will be implemented through a Construction Stormwater Permit. Jurisdictional stream crossings will be regulated by ANR's stream alteration and floodplain permit programs. Jessome Panel pf. at 72-73.

170. The converter station will be covered under both the Construction Stormwater Permit and an Operational Phase Stormwater Permit. Jessome Panel pf. at 72-73.

171. The Project will use Ammonium Nitrate-Fuel Oil ("ANFO") and dynamite for blasting. ANFO is a commonly used explosive that consists of approximately 90-95% ammonium nitrate

mixed with fuel oil. Explosions will be initiated with "blasting caps" or initiators. Michael B. Smith, ANR ("Smith") pf. at 6.

172. The primary groundwater contamination issue with the use of large amounts of ANFO and, to a more limited extent, dynamite, has been increased nitrates in groundwater. There may also be a minimal increase in some compounds associated with the fuel oil component. Smith pf. at 6-7, 9-10.

173. In order to protect groundwater quality the Vermont Department of Environmental Conservation ("VT DEC") BMPs will be included in the Project's blasting plan and adhered to, and the Project will avoid the use of perchlorate. Smith pf. at 6-7, 9-10.

174. If, during the construction of the Project, unforeseen conditions necessitate blasting that will remove 5,000 cubic yards of rock in a single area, an assessment and monitoring plan will be developed for review and approval by the VT DEC and implementation by TDI-NE. Smith pf. at 6-7, 9-10.

Lake Water Quality

175. To minimize turbidity associated with the HDD operation during Project construction, TDI-NE proposes to have the HDD boring enter into a receiver casing driven into the lake bottom at sufficient depth to contain drilled mud. In lieu of the receiver casing, a temporary cofferdam might be constructed at the offshore exit-hole location using steel sheet piles driven by a barge-mounted crane. The cofferdam would be rectangular in shape and open at the end facing away from shore to allow for pull-back of the conduits and cables. Accepted industry practices for spill prevention and control will be implemented during the in-lake HDD activities. Murphy pf. at 8.

176. During installation, a qualified environmental inspector will be on board the installation vessel and will be responsible for monitoring compliance with all applicable permit and approval requirements. If elevated TSS levels associated with the shear plow and jet plow installations are reported, the installer will employ measures such as changing the rate of advancement of the jet plow or shear plow, modifying hydraulic pressures, or implementing other reasonable operational controls that may reduce temporary suspension of *in situ* sediments. Murphy pf. at 9.

177. The public benefit funds directed at Lake Champlain will assist in improving water quality and other restoration efforts addressing water quality issues that pre-existed the Project. Jessome Panel pf. at 23; exhs. TDI-JMB-19a, TDI-JMB-20.

178. The NECPL will be installed and operated in the lake in a manner that complies with the Vermont Water Quality Standards ("VWQS"), based on certain testing and modeling with respect to suspended sediments, phosphorous, other existing contaminants, thermal changes, and magnetic fields. Murphy pf. at 13; exhs. TDI-WHB-2, WHB-3 and AT-2.

179. Five representative locations along the cable route were used to complete the water quality assessment, including shallow northern and southern lake locations – approximately 20 feet deep – and three deeper mid-lake locations with depths ranging from approximately 60 to 300 feet. These five locations are indicative of the water quality changes expected along the entire cable route based on sediment characteristics and lake bottom currents. Thuman pf. at 11; exh. TDI-AT-2.

180. The modeling results at each of the five locations demonstrate that the water quality impacts associated with cable installation are short-term and geographically limited to areas adjacent to the cable installation location. Thuman pf. at 11; exh. TDI-AT-2.

181. The calculated increases in Total Suspended Solids ("TSS") and total phosphorus ("TP") will be a one-time event lasting a few hours and will be of limited spatial and vertical extent. All of the constituent concentrations from Project-related activities are less than the relevant VWQS criteria at all times, including the calculated dissolved metals concentrations and existing dissolved sediment concentrations, which are less than the applicable acute and chronic VWQS criteria. Thuman pf. at 15; exh. TDI-AT-2.

182. The applicable water quality standards in Lake Champlain are for the eight metals analyzed – arsenic, cadmium, copper, lead, nickel, zinc, silver, and mercury – and for TP. All of the calculated metals concentrations are less than the applicable acute and chronic VWQS; therefore, the Project will be in compliance with the VWQS for metals. Thuman pf. at 15-16; exh. TDI-AT-2.

183. For TP, the VWQS criteria vary in the lake along the cable installation route from 0.010-0.025 mg/L and are applied as an annual mean in the euphotic zone. There is no specific

VWQS criterion for TSS, but calculated TSS concentration increases are less than 3 mg/L above background levels at 200 feet from the point of installation within one to four hours from the time of cable installation. Thuman pf. at 16; exh. TDI-AT-2.

184. The majority of the one-time, short-term phosphorus increases near the bottom of the lake due to the cable installation will be confined to water depths deeper than the euphotic zone and the mixed layer depth. Therefore, it is not expected that phosphorus and algal levels in the surface layer of the lake will be affected by the Project, or that construction of the Project will meaningfully contribute to existing exceedances of the VWQS for TP in Lake Champlain. Thuman pf. at 18; exh. TDI-AT-2.

Aquatic Route & Installation

185. The aquatic transmission cables do not contain any hazardous fluids, thereby eliminating any potential for sediment contamination from the cables themselves. Jessome Panel pf. at 73.

186. During construction, installation barges will contain small amounts of hazardous wastes – primarily used oils, solvents, and lubricants. To minimize potential impacts from hazardous materials and wastes, TDI-NE will require that all contractors follow appropriate hazardous material and waste-handling protocols and additional measures proposed by TDI-NE. Jessome Panel pf. at 73.

187. The use of the jet plow installation method in the shallower portions of the lake will result in only temporary impacts on water quality, with background conditions being restored in a short period. In deeper waters, where there is a low risk of interaction with maritime users, the cables will be laid on the bottom to allow for self-burial. Murphy pf. at 16.

188. In the southern portion of the route, south of Chimney Point, TDI-NE proposes to use the shear plow installation method. This method will reduce the expected sediment suspension with a narrower trench than is created with the jet plow and will help minimize disturbance of any areas in southern Lake Champlain where historic anthropogenic activities may have affected the quality of lake sediments. Murphy pf. at 16.

189. Prior to installing the aquatic line, TDI-NE will conduct a debris-clearing run along the NECPL's aquatic route. Using a tug and barge equipped with a grapnel system and crane, and

followed by support vessels to transport crew members and collected debris, the route will be cleared of objects – woody debris, trees, stumps, historical sawn logs, etc. – along the lakebed that could obstruct the burial of the line during installation. TDI-NE will consult with ANR to develop a plan to ensure that these materials are placed back in the lake but outside of the installation corridor and any sensitive habitats identified by ANR in advance of construction. TDI-NE will not commence the debris-clearing in areas of known or suspected cultural resources until any potential impacts on underwater historic sites have been resolved as set forth in Attachment III to the DPS/ANR/DHP Stipulation. Jessome Panel pf. at 36; Murphy supp. pf. at 13; exh. TDI-JMB-19a, attachment II at 7-8, and attachment III at 2-3.

190. Within the first 1-2 miles of the in-lake portion of the route, it is anticipated that the transmission cables will be installed by divers due to the shallowness of the waters and the presence of potential cultural resources. From MP 2 to MP 22, where waters are generally less than 150 feet in depth, the jet-plow installation method will be employed. In waters of greater than 150 feet, which generally extend from MP 22 to MP 66, TDI-NE will lay the cables on the lake bottom and allow for self-burial where the cables are not crossing utilities or bedrock. Jet-plow installation will be initiated again from MP 66 to MP 74, at which point shear-plow installation will occur until MP 98. Murphy pf. at 7; exh. TDI-JMB-5 (revised).

191. The jet plow uses pressurized water to "fluidize" the sediments to create an approximately 4-foot-deep- by 8-to-18-inch-wide trench. It is fitted with hydraulic pressure nozzles that create a downward and backward flow within the trench, allowing the transmission cables to settle into the trench under their own weight before the sediments settle back into the trench. Sediments quickly fill in due to the narrowness of the trench, the loose sediment, and the installation of the cables on the trench bottom. Jessome Panel pf. at 37; exh. TDI-JMB-5 (revised).

192. Where sediment stiffness is low and the waterway is narrow, shear-plow installation will be used. For this installation technique, the plow is tethered to a surface support vessel, which tows the plow along the lakebed, opening up a trench of somewhat smaller size and depth than that created with the jet plow. Jessome Panel pf. at 37; exh. TDI-JMB-5 (revised).

193. For the divers lay, jet plow, and shear plow installation methods, the transmission cables will be buried approximately 3-4 feet deep in the lakebed. In places where the transmission

cables will be laid directly on the lake bottom, they will self-bury an average of approximately one foot into the sediment, except where laid directly on bedrock, which is expected to be less than 2% of the entire route. During the final design process, TDI-NE will likely seek to relocate the cable off these bedrock formations to the extent practical, as it is preferable to have the cables in sediment. Murphy pf. at 7; exh. TDI-JMB-5 (revised).

194. Depending on the installation technique deployed, approximately 1.4 miles (shear plow or jet plow) to 7.8 miles (bottom lay) of transmission cables can be installed per 24-hour day in an aquatic environment. Jessome Panel pf. at 46.

195. Where prevailing conditions make burial impractical, additional protection beyond the cable armoring is needed. The most common challenges to burial are addressing existing infrastructure or geological features such as bedrock. When confronted by these conditions in water less than 150 feet in depth, protective concrete mattress systems are deployed to achieve maximum protection. For example, where the transmission cables would cross existing utility infrastructure such as a pipeline or another cable, depending on how deep the utility infrastructure is buried, mattresses may be laid over the existing utility, and protective articulated concrete mats would be installed over the cable crossing. Jessome Panel pf. at 37-38; Murphy pf. at 7; exh. TDI-JMB-5 (revised).

196. Minimal land-based support will be required for installation of the aquatic transmission cables in Lake Champlain. The land-based port facility for supporting transmission cable installation will be located at a suitable facility on Lake Champlain with capabilities to support crew and installation and dive operations. An approximately 60,000-square-foot, temporary storage area at the port facility may also be required to support the cable installation activities. TDI-NE's marine contractor will identify site specifics including necessary mechanical, sanitary, provisions, supplies, and hoist requirements. Jessome Panel pf. at 41-42.

197. Impacts due to repair work during Project operation will be similar to, but smaller in scale than the impacts anticipated during Project installation. Murphy pf. at 14-15.

Water-Related Permits & Agreements

198. TDI-NE and ANR have agreed to address ANR's concerns regarding unexpected drilling fluid release, HDD cofferdams, and real-time water quality monitoring through conditions in the DPS/ANR/DHP Stipulation. Exh. TDI-JMB-19a.

199. TDI has agreed to prepare, in consultation with ANR, a Lake Champlain Construction Phase Water Quality Monitoring Program, which will establish the water quality monitoring that will occur during both route clearing and cable installation. Murphy supp. pf. at 6-7; exh. TDI-JMB-19a; TDI-SM-6.

200. TDI-NE and ANR resolved concerns regarding the use of vessels in Lake Champlain during construction of the Project through the DPS/ANR/DHP Stipulation, under which TDI-NE agreed to prepare an Aquatic Invasive Species Management and Control Plan for approval by ANR prior to installation in the lake. The plan will address specific protocols to be taken to manage aquatic invasive species and the transport, handling, use, and on-site storage of hazardous materials and petroleum products associated with the operation of installation vessels. This plan was submitted as part of the Lake Encroachment Permit application. Murphy supp. pf. at 7-8; exhs. TDI-JMB-19a, TDI-SM-2 (revised); TDI-JAN-14f.

201. TDI-NE also submitted as part of its Lake Encroachment Permit application an HDD Inadvertent Return Contingency Plan ("HDD Contingency Plan") to address the potential for drilling fluid losses. Under the DPS/ANR/DHP Stipulation, TDI-NE has agreed to supplement the HDD Contingency Plan with an Area Specific Plan that will describe the specific protections and actions that will occur for each HDD installation, including those involving lake-to-land transitions. The revised plan will be submitted prior to construction. In addition, TDI-NE will provide Material Safety Data Sheets and product information for all drilling fluids that will be used for water-to-land HDD installation in the lake. Murphy supp. pf. at 10; exhs. TDI-JMB-19a, TDI- JAN-14f.

202. Installation and operation of the lake portion of the NECPL will require a USACE Section 404 permit, an ANR Section 401 Water Quality Certification, and an ANR Lake Encroachment Permit. All major permit decisions are expected before the end of 2015. Jessome Panel pf. at 73-74; exh. TDI-JMB-11 (revised).

203. TDI-NE has agreed to special measures when installing the cables near a deep water intake that provides water to the Grand Isle Consolidated Water District and the VFWD Ed Weed Fish Hatchery. These measures include not conducting pre-installation route clearing, bottom laying the cables in order to reduce the potential for increased turbidity caused by sediment resuspension, and providing notice to the fish hatchery in advance of pre-installation and installation activities. Murphy supp. pf. at 11; exh. TDI-JMB-19a, attachment II at 3-5.

Aquatic Thermal

204. Based on modeling and analysis of temperature changes in sediment and water over the cables during a maximum power transfer of 1,000 MW, the Project's thermal effects are not expected to have an undue adverse impact on water quality under the applicable criteria found in the VWQS. Dr. William Bailey, TDI-NE ("Bailey") pf. at 6-13; exh. TDI-WHB-2.

205. For the majority of the cable route in the lake, the maximum temperature increases associated with the Project will be below the 1°F threshold. For the remainder of the cable route, the areas of temperature increases above 1°F will be extremely limited. Bailey pf. at 12-13.

206. The overall thermal contribution of the cables to Lake Champlain waters will be negligible. Given the limited temperature increases, and the limited area in which the temperature increases are expected, the Project's temperature-related impacts will not result in an undue adverse impact on water quality. Bailey pf. at 11-13; exh. TDI-WHB-2.

207. The portion of the submarine route where the cables are buried will remain within the 1°F temperature change criterion. In those very small areas around partially buried or unburied cables on the remainder of the aquatic route where a temperature increase above 1°F meets the standards for establishment of a mixing zone under VWQS Section 2-04(A) and Section 3-01(B)(1)(d) for "Assimilation of Thermal Wastes," the extent of increased temperatures is very small, and will not affect existing aquatic uses. Bailey pf. at 13; exh. TDI-WHB-2.

208. Based upon the modeling performed, temperature increases due to the Project will not be sufficient to cause the range of temperatures to exceed the natural ranges of temperatures tolerated by major immobile species in Lake Champlain at locations where such species would reside in the vicinity of the cables. Because the temperature zone around the cables is so limited,

other species that are mobile will not encounter higher temperatures for any significant periods. Bailey pf. at 18; exh. TDI-WHB-2.

209. Methylmercury is a toxic form of a widespread environmental contaminant and can accumulate in the tissues of fish and other organisms. TDI-NE's consultant evaluated the effect of cable heating on the methylation of mercury and concluded that the expected increase in temperature is not large enough to affect the rate of mercury methylation in Lake Champlain. Bailey pf. at 17-18; exh.TDI-WHB-2.

210. A plan for post-construction monitoring of the cable for thermal impacts is necessary to determine whether actual thermal impacts are consistent with the modeling presented by TDI-NE. A draft, conceptual thermal monitoring plan was submitted to ANR as part of the revised Lake Champlain Lake Encroachment Permit ("LEP") application on July 14, 2015. Kevin Burke, ANR ("Burke") pf. at 14; exh. TDI-JAN-14f.

211. TDI-NE and ANR resolved the above concerns through the DPS/ANR/DHP Stipulation, under which TDI-NE will develop and implement a post-construction Thermal Monitoring Plan, subject to ANR review and approval. Exhs. TDI-JMB-19a; TDI-SM-7.

Aquatic Magnetic Fields

212. The DC electricity carried on the cables is comprised of moving electric charges and is a source of a DC magnetic field. This magnetic field is not shielded much by the coverings on the conductors or by most materials in the environment, including sediment and water. In contrast, the electric field associated with the voltage applied to the cables, ±320 kilovolts, is contained within the grounded metallic sheathing of the cables. Bailey pf. at 13-14; exh. TDI-WHB-3.

213. The DC magnetic field from the cables is the same as the geomagnetic field of the earth. Because magnetic fields are vectors with a magnitude and direction, the magnetic field from both the cables and the earth must be evaluated together, as they may add to or cancel out one another at a particular location. Bailey pf. at 14; exh. TDI-WHB-3.

214. The DC magnetic field from the earth or the cables is not the same as the AC magnetic field associated with the transport of 60-Hz electricity on power lines and devices connected to the AC electric grid – for example, electric fields will not be induced in stationary objects in a

DC magnetic field, while a 60-Hz magnetic field will induce 60-Hz electric fields in both stationary and moving objects. Bailey pf. at 14; exh. TDI-WHB-3.

215. When water currents flow or fish swim in the geomagnetic field of the earth, a very weak electric field is induced. This electric field was calculated for a typical high-water flow velocity in Lake Champlain to yield a conservative estimate of potential exposure. Bailey pf. at 15; exh. TDI-WHB-3.

216. The effect of the NECPL cables on changes in the ambient geomagnetic field level will be limited to the area immediately surrounding the cables. The change in the calculated magnetic field is greatest directly over the cables, while the calculated DC magnetic field deviations and compass deflections fall off rapidly with distance from the cables. At 10 feet from the cables such deviations are less than 10% of the ambient geomagnetic field level. At 25 feet from the cables, the magnetic field deviation is approximately 1% of the ambient geomagnetic field level. At locations where the lake is more than 150 feet deep, the cables will not be buried and the calculated compass deflection would be less than 1 degree at the water's surface. Bailey pf. at 13-16; exh. TDI-WHB-3.

217. The probability of resident aquatic species encountering areas with significantly altered magnetic fields associated with the buried cable is very low, and impacts will not be adverse. Bailey pf. at 19; exh. TDI-WHB-3.

218. There will be minor changes in the induced electric fields around the cables, but they are not expected to have any significant impacts on aquatic species. The movement of electric charges in either water or in fish through the ambient environmental DC magnetic field of the earth, or as altered by the presence of a DC submarine cable, gives rise to an induced electric field, depending on the speed and direction the water passes over the cable. Bailey pf. at 20-21; exh. TDI-WHB-3.

219. The Project's design incorporates several features that minimize the magnitude of the temperature gradient and magnetic field level around the cables and their spatial extent. Such features include grounded metallic sheaths on the cables to shield the electric field of the conductors; strapping the two cables together; and burial beneath the lake bed in shallower depths to minimize exposures to higher temperatures and magnetic fields at the lake-bed surface

sediment and water. In addition, concrete mattresses in very small sections provide insulation for unburied cables and shield the area around unburied cables where the magnetic field is highest. Bailey pf. at 21-22.

Headwaters

[10 V.S.A. § 6086(a)(1)(A)]

220. The NECPL will meet all applicable health and Department of Environmental Conservation Department ("VT DEC") regulations regarding reduction of the quality of the ground or surface waters flowing through or upon lands that are not devoted to intensive development. This finding is supported by findings 221 through 224, below.

221. An Operational Phase Stormwater Discharge Permit will be required for the converter station because the proposed amount of impervious surface exceeds the one-acre threshold for the VT DEC operational-phase stormwater program. Nelson pf. at 11; Nelson supp. pf. at 6-7; exh. TDI-JAN-14c.

222. Water resource field studies that were completed on behalf of TDI-NE analyzed available information, including topographic maps and state-mapped public water supply source protection areas. Nelson pf. at 10-11; exh. TDI-JAN-2.

223. Within portions of the NECPL study areas there are discrete areas of steep slopes (typically those greater than 15 percent grade) with shallow soils, and drainage areas of several Vermont-mapped and delineated water features of less than 20 square miles. The cable alignment is located above 1,500 feet in elevation in the towns of Mount Holly and Ludlow, ranging from 1,500 to 1,600 feet above sea level. Nelson pf. at 11; exh. TDI-JAN-2.

224. With incorporation of construction-phase BMPs and adherence to the EPSC approach described further in the findings on soil erosion, the NECPL will meet the applicable VT DEC regulations regarding any reduction in the quality of ground or surface waters in all areas of construction, including headwater areas. Nelson pf. at 12; exhs. TDI-JAN-14b and 14c.

Waste Disposal

[10 V.S.A. § 6086(a)(1)(B)]

225. Project construction and operation will meet applicable health and environmental conservation regulations regarding the disposal of wastes, and will not involve the injection of waste materials or any harmful or toxic substances into groundwater or wells. Murphy pf. at 18-19; Nelson pf. at 14. This finding is further supported by findings 226 through 235, below.

226. The native ground material removed for trenching the terrestrial portions of the NECPL will be stockpiled near the trench excavations and used as backfill after installation of the transmission line. Any material that is not suitable as backfill will be properly disposed of at an off-site location. Jessome Panel pf. at 74.

227. Solid waste from the terrestrial portion of the NECPL may consist of unusable excavation material, gravel, and other materials typically found in trench excavation activities. There is minimal solid waste expected from the lakebed cable installation because no materials are being added to or removed from the lake bottom, with the exception of concrete mats and the cables. Any solid waste that is generated will be disposed of in accordance with relevant solid waste regulations through private haulers and will create no burden on local government. Jessome Panel pf. at 74.

228. During the construction of the aquatic portion of the Project, waste material generated on vessels will be stored in holding tanks until it can be disposed of at a sanitary waste pump-out facility. Once the Project is operational, no sanitary facilities will be required. Murphy pf. at 18.

229. TDI-NE will enact certain measures to prevent, control, and minimize potential impacts from petroleum products or hazardous materials and wastes. All contractors will be required to follow the protocols of a Spill Prevention, Control, and Countermeasure Plan or its equivalent and to have appropriate spill control equipment on hand and ready to use. Murphy pf. at 18.

230. A visual and operational monitoring program will be implemented during HDD operations to detect any losses of drilling fluid. The monitoring program will consist of visual observations of the surface water at the targeted drill exit point, as well as operational monitoring of the drilling fluid volume and pressure within the borehole. Visual observations of drilling fluid in the water or excessive loss of volume or pressure in the borehole will trigger response actions by

the HDD operator, including halting drilling activities and initiating cleanup of any released drilling materials. A barge with a pumping system will be positioned at the cofferdam (if utilized) during drilling to collect any drilling fluid released into the cofferdam enclosure. Any collected drilling fluids will be disposed of at a permitted facility. Murphy pf. at 18.

231. TDI-NE will supplement its HDD Contingency Plan prior to construction. Murphy supp. pf. at 10; exhs. TDI-JMB-10, 10a; TDI-JMB-19a; TDI-JAN-14f.

232. Under the DPS/ANR/DHP Stipulation, TDI-NE will revise, as needed, its Overall Oil and Hazardous Materials Spill Prevention and Contingency Plan ("Spill Plan") or submit to ANR a stand-alone plan to address aquatic and overland construction activities at least 90 days prior to any site preparation or construction. Appropriate implementation of the Spill Plan will avoid the risk of the injection of hazardous wastes into groundwater. Nelson supp. pf. at 7-8; Murphy supp. pf. at 7; exh. TDI-JMB-19a.

233. With respect to sanitary wastewater, portable toilets serviced by a licensed septic hauler will be used on-site during Project construction. Once the Project is operational, no sanitary facilities will be required, as the converter station will not have permanent on-site staffing. TDI-NE owns a house with existing wastewater facilities adjacent to the converter station. Nelson pf. at 12.

234. The majority of the overland portion of the NECPL involves 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 will 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. Nelson pf. at 12; exhs. TDI-JAN 14b, 14c.

235. An Operational Phase Stormwater Discharge Permit has been applied for, utilizing construction-phase BMPs to protect the water quality of receiving waters, minimize soil erosion, and manage stormwater. Nelson supp. pf. at 7; exh. TDI-JAN-14c.

Water Conservation

[10 V.S.A. §§ 6086(a)(1)(C)]

236. The design of the Project considers water conservation, incorporates multiple use or recycling where technically and economically practical, utilizes the best available technology for such applications, and provides for continued efficient operation of these systems. This finding is supported by findings 237 through 239, below.

237. Use of water during construction will be primarily for earthwork compaction and dust control during the terrestrial stages of the Project. This water will be brought on site by the contractor if sufficient quantities are not found to be available locally. No water use will be required for installing the aquatic portions of the Project, other than water from the lake itself for the jet plow; that water will be recirculated back into the lake. Jessome Panel pf. at 75.

238. Operation of the NECPL will not require the use of water other than for sanitary facilities to be located on TDI-NE property at or near the converter station, as required. A wastewater/water supply permit is not anticipated for the Project. Jessome Panel pf. at 75.

239. Considering the limited and temporary water usage needed, the NECPL will ensure that reasonable efforts are made to conserve water. Nelson pf. at 14.

Floodways

[10 V.S.A. § 6086(a)(1)(D)]

240. The Project will not 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 will not significantly increase the peak discharge of the river or stream within or downstream from the area of development or endanger the health, safety, or welfare of the public or riparian owners during flooding. This finding is suppported by findings 241 through 251, below.

241. The Project 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. Additionally, any 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. Nelson pf. at 16.

242. Federal Emergency Management Agency ("FEMA") Flood Insurance Rate Maps and floodway maps indicate that floodway or floodway fringe areas are associated with 22 of the streams that occur within the Project's alignment. Nelson pf. at 15; Nelson supp. pf. at 9; exh. TDI-JAN-3 (revised).

243. The Project crosses 52 river corridors and 22 flood hazard areas. Rob Evans, ANR ("Evans") pf. at 5.

244. Project construction within existing road or railroad ROWs will be followed by the restoration of existing topography, such that no hydrological impacts are expected due to the Project's intersection with floodways. Moreover, Project construction areas will be re-vegetated and returned to their preexisting contours to the extent feasible. Jessome Panel pf. at 75-76.

245. The converter station is located outside FEMA Zone A designated areas; therefore, this facility will not affect floodways or floodway fringes. Nelson pf. at 16.

246. The Project requires a state floodplain permit under the Flood Hazard Area and River Corridor Rule, which requires projects in flood hazard areas and river corridors to: (1) meet a No Adverse Impact Standard by demonstrating that development will not increase flood elevations or velocities, decrease flood storage volume, or increase erosion hazards; and (2) comply with Floodplain Management Standards to ensure that flood risk is minimized. Evans pf. at 5-8.

247. At all locations where the Project alignment crosses fluvial erosion hazard ("FEH") corridors, existing infrastructure, such as roadways and railroads, will preclude the natural lateral migration over time of the subject streams or rivers. The FEH boundary is considered to be sufficiently protective to avoid and minimize impacts from the Project due to fluvial erosion or channel migration. Nelson pf. at 14-16; Nelson supp. pf. at 10.

248. A Flood Hazard Area and River Corridor Permit ("Floodplain Permit") application was submitted on April 30, 2015. Nelson supp. pf. at 10; Exh. TDI-JAN-14e.

249. TDI-NE and ANR resolved concerns regarding stream and river crossings through the DPS/ANR/DHP Stipulation, under which TDI-NE has amended its Floodplain Permit application to consider alternative crossing methods for the Black River stream crossing at MP 149 and to change proposed crossing methods at MP 103.1 in Benson and 144.8 in Mount Holly as specified in the stipulation. If the aerial crossing method is the only practical alternative for crossing the

Black River, TDI-NE will provide ANR with additional specifications that demonstrate the ability to withstand flood forces from 1% and 0.2% annual change flood events and place signage on the East Lake Road Bridge. Nelson supp. pf. at 4-5, 13; exh. TDI-JMB-19a; exh. TDI-JAN-14e.

Streams

[10 V.S.A. § 6086(a)(1)(E)]

250. The Project will maintain the natural condition of the stream wherever feasible and will not endanger the health, safety, or welfare of the public or of adjoining landowners. This finding is supported by findings 251 through 257, below.

251. 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. All delineated streams and rivers are Vermont Class B waters, as designated by the 2014 VWQS. Nelson pf. at 17; Exh. TDI-JAN-14d.

252. Approximately 151 streams of varying flow regimes – 52 perennial streams, 72 intermittent streams, and 27 ephemeral channels – will be traversed by the Project within the ROWs. The majority of these streams will be crossed at an existing culvert or, for smaller streams, via an open trench near the culvert inlet/outlet. Larger streams and rivers will be crossed via HDD so impacts to the channel bed and banks will be avoided. In addition, there will likely be opportunities to improve stream connectivity and hydrology through replacement of existing deteriorated or undersized culverts in certain locations. No streams adjacent to the converter station will be affected. Nelson pf. at 20; Nelson supp. pf. at 11; Jessome Panel pf. at 77.

253. Eleven named streams would be crossed by the 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. Nelson pf. at 20; Nelson supp. pf. at 10-11; exh. TDI-JAN-6a.

254. Forty-three of the 52 perennial stream crossings will occur in a manner that will avoid disturbance of the bed or banks of the stream. For the remaining streams, TDI-NE will utilize the

methodologies provided for in the DPS/ANR/DHP Stipulation. These methods include an over-culvert crossing at MP 133.4 and an aerial crossing of the Black River at MP 149. Nelson supp. at 12-13; exh. TDI-JMB-19a.

255. On August 4, 2015, TDI-NE submitted a revised Stream Alteration Permit Application, which describes the stream crossings in detail. Exh. TDI-JAN-14d.

256. By largely constructing the transmission line within existing road and railroad ROWs, the Project will avoid placing new infrastructure within otherwise unconstrained river corridors and will minimize the amount of in-stream work by installing crossings at the locations of existing culverts and bridges. The construction and operation of the NECPL will maintain the natural condition of streams within the Project alignment. Nelson pf. at 21.

257. 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. Nelson pf. at 21.

Shorelines

[10 V.S.A. § 6086(a)(1)(F)]

258. The Project will not have an undue adverse effect on shorelines. This finding is supported by findings 259 through 263, below.

259. There are two open water-body shorelines within the Project area: Lake Champlain and Lake Bomoseen. Additionally, shorelines are associated with the following rivers that are intersected or parallel to the Project route: Hubbardton River, Castleton River, Clarendon River, Otter Creek, Cold River, Mill River, and Black River. Nelson pf. at 23; exh. TDI-JAN-3 (revised).

260. TDI-NE submitted the Lake Bomoseen LEP application on March 25, 2015, and a revised Lake Champlain LEP application on July 14, 2015. Nelson supp. pf. at 14; exhs. TDI-JAN-14f, 14g.

261. The Project has been designed to avoid crossing or otherwise physically affecting the shorelines of Lake Champlain or Lake Bomoseen through the use of HDD at the entry and exit points. 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. The HDD exit point in Benson is located approximately 400 feet from the shoreline, and 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 and will not require any vegetation removal within the shoreline area or 100-foot riparian buffer. Nelson pf. at 24; Jessome Panel pf. at 77.

262. The Project will cross shorelines associated with river crossings in a manner that does not disturb the shoreline or existing vegetation associated with the shoreline area. Nelson pf. at 24.

263. TDI-NE and ANR concerns regarding a bank restoration and long-term maintenance plan were resolved through the DPS/ANR/DHP Stipulation, under which TDI-NE will consult with ANR and produce a bank restoration and long-term maintenance plan for this area that reestablishes bank stability and shoreline habitat. Burke pf. at 15; Nelson supp. pf. at 14-15; exh. TDI-JMB-19a.

Wetlands

[10 V.S.A. § 6086(a)(1)(G)]

264. The NECPL will not result in undue adverse impacts on significant wetlands. This finding is supported by findings 265 through 278, below.

265. The Project will not result in undue adverse impacts on wetlands protected under the Vermont Wetland Rules, and any impacts will be regulated under a Vermont Wetlands Permit and 401 Water Quality Certification. Project design and mitigation measures will avoid impacts on wetlands as a result of the Project to the extent practicable. Nelson pf. at 35.

266. In conducting field investigations along the terrestrial alignment of the Project, two distinct areas were defined. The "Study Area" was comprised generally of the lands within the roadway and railroad ROWs within which Project activities will occur during both the construction and operational phases. In addition, a supplemental area generally 50 feet wide outside the road or railroad ROWs was added to the Project plan in order to approximate the boundaries of potential wetlands and/or wetland buffers. This area is referred to by TDI-NE as the "Approximate Study Area." Nelson pf. at 27; exhs. TDI-JAN-6b; TDI-JAN-14a.

267. TDI-NE's wetland investigation and delineation included assessments for the presence of any Class I, Class II, or Class III wetlands within the Study Area and Approximate Study Area. Nelson pf. at 28; exhs. TDI-JAN-6b; TDI-JAN-14a.

268. No areas that would meet vernal pool criteria were identified within the designated Study Area. Nelson pf. at 29; exhs. TDI-JAN-3 (revised), JAN-13b.

269. Many of the wetlands and buffers mapped within the Project vicinity are colonized by non-native invasive species ("NNIS") within previously disturbed areas associated with features such as roadside drainage swales. As a result, these wetlands would generally be considered to be of lower quality than features without the presence of NNIS. Nelson supp. pf. at 28; exh. TDI-JAN-13f.

270. There are no Class I wetlands in the vicinity of the Project; therefore none will be affected. Nelson supp. pf. at 32.

271. The Project will result in a total of 2.90 acres of impacts on Class II wetlands, consisting of 1.37 acres of impacts in the Project corridor and 1.53 acres of impacts in temporary off-road work areas. Nelson supp. pf. at 16; exh. TDI-JAN-14a

272. Of these affected wetlands, 2.13 acres are currently forested and 0.77 acres are non-forested. Ongoing vegetation maintenance will occur within the Project corridor as necessary, resulting in the permanent conversion of 0.60 acres of forested wetland to non-forested wetland. The Project will not result in permanent fill impacts on Class II wetlands for either the cable alignment or the converter station. Nelson supp. pf. at 16; exh. TDI-JAN-14a.

273. The Project will result in a total of 11.02 acres of impacts on Class II wetland buffers, consisting of 5.84 acres of impacts in the Project corridor and 5.18 acres of impacts in temporary off-road work areas. Nelson supp. pf. at 17; exh. TDI-JAN-14a.

274. Of these affected buffer zones, 6.34 acres are currently forested and 4.68 acres are non-forested. Ongoing vegetation maintenance will occur within the Project corridor as necessary, resulting in the permanent conversion of 1.16 acres of forested wetland buffers to non-forested buffers. The Project will not result in permanent fill impacts on Class II wetland

buffers for the cable alignment or the converter station. Nelson supp. pf. at 16-17; exh. TDI-JAN-14a.

275. There will be no wetland impacts associated with the converter station. Nelson supp. pf. at 17, 18; exh. TDI-JAN-3 (revised).

276. A Vermont Wetland Permit application was filed on March 6, 2015, and revised on August 4, 2015, and a Section 401 Water Quality Certification application was filed on April 1, 2015, and revised on August 5, 2015. Nelson supp. pf. at 15; exhs. TDI-JAN-14a, TDI-JAN-14h.

Sufficiency of Water and Burden on Existing Water Supply

[10 V.S.A. §§ 6086(a)(2) & (a)(3)]

277. There is sufficient water available for the reasonably foreseeable needs of the Project because construction and operation of the Project will not involve a substantial use of water, and the Project will not have an unreasonable burden on existing water supplies. This finding is supported by findings 280 through 295, below.

Aquatic Route

278. During construction of the aquatic portion of the route, water use will be limited to the *de minimis* use of potable water for construction personnel and water for the operation of the jet plow. Murphy pf. at 19.

279. There is no direct water use associated with operation of the Project in the lake. Murphy pf. at 19.

280. Lake Champlain is used as a source of water for various public water systems, as well as for private users. The Project will cross through one designated Source Protection Area ("SPA") for a Vermont public water supply intake and will pass through the same general portions of the lake as ten other Vermont public water supply systems that use lake intakes for raw water, which is subsequently treated for potable usage. Murphy pf. at 20; exh. TDI-JAN-11a (revised).

281. The locations of all known Vermont public water system lake intakes have been mapped and are avoided by the Project. In addition to observation during installation, TDI-NE will

perform pre-construction reconnaissance, including a side-scan sonar analysis and bottom sampling of the lake, to ensure that the cable is placed where it does not interfere with existing public or private intakes and other infrastructure. Also, TDI-NE will notify all public water systems shown on exhibit TDI-JAN-11b (revised), as well as others identified by the VT DEC and the Vermont Department of Health ("VT DOH"), at least three weeks prior to construction. Notification will be in writing and will include detailed information on the Project schedule, methods, predicted effects on sediment and turbidity, and contact information. Murphy pf. at 21; Exh. TDI-JAN-11(b)(revised).

282. The Project will pass in the vicinity of some private water intakes, such as summer camps, that obtain water from the lake. These water sources are typically located close to shore and generally outside the area of temporarily-suspended sediment that will result from Project construction. These systems operate at low flow rates, further reducing the potential that they would entrain sediment or turbidity from Project construction. Neither the VT DEC nor the VT DOH is aware of any private water intakes along the Project route itself. Murphy pf. at 20-21; exh. TDI-JAN-11a (revised).

283. TDI-NE and ANR resolved concerns regarding the Project's potential impact on the VFWD's Ed Weed Fish Culture Station, located at 14 Bell Hill Road in Grand Isle, Vermont, through the DPS/ANR/DHP Stipulation. Under the stipulation, TDI-NE has modified its route through Lake Champlain near the deep-water intake of the Grand Isle Consolidated Water District, which supplies water to the Station almost continuously during the year, so that the Project cable will be located a minimum of 300 feet to the west of the deep-water intake. Miller pf. at 6-17; Burke pf. at 10-11; Murphy supp. pf. at 3-4; exhs. TDI-JMB-4 (revised); TDI-JMB-19a.

Terrestrial Route

284. The overland installation of the Project will have no undue adverse effect on water sources because 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 ROWs, and will be limited in both vertical extent as well as trench width. In addition, TDI-NE

has prepared a blasting plan that includes pre- and post-blast surveys of nearby water supplies, and TDI-NE will remediate any damage from blasting. Nelson pf. at 38.

285. The overland portion of the Project will involve limited, temporary 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 by the terrestrial portions of the Project. Nelson pf. at 36.

286. 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. Nelson pf. at 36; exh. TDI-JAN-11a (revised).

287. The Project is not expected to cause any adverse impacts on existing wells or springs, such as loss of yield or decreased water quality. Nelson pf. at 36.

288. In accordance with the DPS/ANR/DHP Stipulation, TDI-NE will undertake an evaluation of the potential impacts on groundwater in the event that more than 5,000 cubic yards of bedrock will be blasted in a single work zone in connection with the Project. TDI-NE will avoid the use of initiators that contain perchlorate, and will not use perchlorate in connection with blasting for the Project. Nelson supp. pf at. 19; exh. TDI-JMB-19a.

289. The Project will cross through a number of SPAs for public water supplies along the overland route and in the vicinity of other public water supplies. These include nine public water systems using groundwater sources that have either designated SPAs or public water sources within the immediate vicinity of the Project. The Project also will pass by various existing private water supplies, including drilled bedrock wells. Nelson pf. at 37; exhs. TDI-JAN-11a (revised), TDI-JAN-11b (revised).

290. During construction of the Project, any ledge encountered will be removed by the most suitable technique, with a preference for mechanical removal rather than blasting. If mechanical removal is not possible, 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 for greater depth. Blasting, if needed,

would be conducted only to the extent necessary to remove rock to allow the cables to be buried. Nelson pf. at 36-37; exh. TDI-JMB-10, 10a.

291. TDI-NE's Blasting Plan will require pre-blast and post-blast surveys of any potentially affected water wells, and TDI-NE will be responsible for any damage caused to wells. TDI-NE will continue to consult with abutters and towns to understand water systems in proximity to the route that could be affected. These systems will be avoided to the extent possible or replaced in kind. Jessome Panel pf. at 78; exhs. TDI-JMB-10; TDI-JMB-10a.

Soil Erosion

[10 V.S.A. § 6086(a)(4)]

292. The Project will not cause unreasonable soil erosion or a reduction in the capacity of the land to hold water so that a dangerous or unhealthy condition may result. This finding is supported by findings 293 through 303, below.

293. Earth disturbance associated with construction of the NECPL will result from tree clearing, trenching for cable installation, HDD and Jack-and-Bore set-up locations,[16] temporary grading in the construction ROW, temporary lay-down and staging areas at cable jointing locations, and grading for the proposed converter station. Nelson pf. at 38.

294. A project-specific EPSC plan has been prepared in accordance with the Vermont Standards and Specifications for Erosion Prevention and Sediment Control and in connection with the Construction Stormwater Discharge Permit application. Nelson pf. at 39; exh. TDI-JAN-14b.

295. The EPSC plan will be implemented during construction in accordance with the anticipated Individual National Pollutant Discharge Elimination System Permit conditions, through the completion of final post-construction stabilization. The EPSC plan will ensure that discharges of stormwater runoff from the construction of the Project will not result in undue soil erosion or a reduction in the capacity of the land to hold water. Nelson pf. at 42.

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16. Jack and Bore is a technique for forming a horizontal bore hole through the ground (e.g. under a paved road in support of culverts) from a drive shaft to a reception shaft by means of a rotating cutting head. Jack and Bore is the primary method utilized to span a road; if it is not used, lane restrictions could result. Jessome Panel pf. at 47.

296. The Project will not result in any reduction in primary agricultural soil availability. Although the Project cable alignment crosses areas mapped as primary agricultural soils, these soils are located within existing transportation ROWs and are not considered available for agricultural operations. No primary agricultural soils are present at the converter station site. Nelson, pf. at 40.

297. Typically, the two cables will be laid side-by-side, approximately 12 to 18 inches apart, in a trench approximately 4-5 feet deep. After the cables are laid in the open trench, the trench will be backfilled with native materials, if appropriate, or low thermal resistivity material such as well-graded sand to fine gravel, stone dust, or crushed stone. A protective cover will be placed directly above the low thermal resistive backfill material, and marker tape will be placed above the cover. In certain areas that present particular engineering or environmental challenges, HDD or Jack-and-Bore will be utilized in lieu of trenching. Jessome Panel pf. at 33; exh. TDI-AW-3 (revised).

298. Standard excavation equipment will be used to dig the trench, such as excavators, backhoes, and loaders. Typical cable segment lengths range from 0.2 to 0.4 miles and will be spliced together utilizing specialized teams provided by the cable manufacturer in pre-excavated pits that will house the modular splice enclosures to create the necessary clean room conditions. Any excavated soils will be temporarily stockpiled adjacent to the worksite or transported off-site if on-site storage is not possible. Where soil is stockpiled on-site, it will be temporarily stabilized with Erosion Prevention and Sediment Control ("EPSC") measures. The width of the temporary construction areas will be approximately 20 feet to 50 feet, depending on existing constraints and available ROW. Jessome Panel pf. at 33-34.

299. Once construction is complete along the overland route, an approximately 12-foot-wide area along the route will be kept clear of deep-rooted trees for the life of the Project. Jessome Panel pf. at 34.

300. Given the anticipated subsurface conditions in some trench locations along the overland segment, bedrock or ledge is expected to be encountered. If encountered, it will be removed by the most suitable technique, to be determined in the field, with a preference for mechanical removal – excavating the rock with an excavator bucket, cutting device, and/or pneumatic

hammer – if cost effective. 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. Jessome Panel pf. at 42.

301. Blasting could occur at any point in the terrestrial portion of the Project, including for site preparations for the Ludlow converter station. Blasting requirements and procedures will follow federal, state, and VTrans guidelines regarding:

i. Pre and post-survey blast notifications: Property owners will be notified by certified mail and via public meeting about planned blasting. Any property owners within 500 feet of a blast site will be offered water quality/flow testing, which will be documented before and after blasting. Blasting will be seismically monitored with the goal of ensuring minimal ground vibrations.

ii. Blasting procedures: All blasting will be scheduled during the day and will include warning and all-clear signals. Blasting areas will be restricted from unauthorized entry, and blasting procedures shall be best practices (blast direction, stemming character, use of mats, and dust and noise control). All blast vibrations shall be monitored and will not exceed federal guidelines as dictated by the U.S. Bureau of Mines.

iii. Delivery and storage of explosives: All explosives will be delivered daily and will not be stored on site.

iv. Blaster qualifications: The blasting contractor in charge will be licensed in the State of Vermont and insured for use and transportation of explosives. All blasting will be performed in accordance with all applicable laws and regulations.

These and other elements of the blasting program are described in NECPL's Blasting Plan. Jessome Panel pf. at 43-44; Wironen pf. at 8-9; exhs. TDI-JMB-10 and 10a.

302. TDI-NE's proposed route design largely avoids tree clearing, as the cable is proposed to be installed adjacent to or within roads. However, there are stretches along the route, primarily within the VTrans ROW, where tree clearing will occur. In these cases, clearing is primarily restricted to areas where the cleared ROW is too narrow to accommodate the installation of the

cable. Hedgerows or mature trees in front of houses will be avoided to the extent possible. In certain cases, tree clearing will avoid other resources, such as rare plant areas, wetlands, or cliffs close to the road. Jessome Panel pf. at 44.

303. Where tree clearing does occur, it will be primarily in forested areas and will increase the cleared zone of the road ROWs. If tree removal does have an impact on landowners, TDI-NE will consider replanting trees off the ROW with property owner consent. Jessome Panel pf. at 44.

Transportation Systems

[10 V.S.A. § 6086(a)(5)]

304. The Project will not cause unreasonable congestion or unsafe conditions with respect to the use of the highways, waterways, railways, airports and airways, and other means of existing transportation. This finding is supported by findings 307 through 327, below.

Traffic Management

305. TDI-NE will develop traffic management plans and coordinate with VTrans, Green Mountain Railroad ("GMR"), and local officials to minimize traffic delays and ensure safe working conditions in the public ROWs. Additionally, Project construction is concentrated in discrete areas for relatively short durations. Jessome Panel pf. at 79.

306. Work along the proposed route will involve lane closures, lane reductions, road closures, and other potential traffic disruptions. TDI-NE will ensure that each residence and business along the route will have roadway access during Project construction. Work along narrow municipal roads may require roads to be restricted to one lane and closed to all but local traffic. In Alburgh, Benson, and Ludlow, properties will be reachable by following alternate routes or detours. Wironen pf. at 9.

307. All detours, road closures, lane restrictions, and other traffic pattern changes will be coordinated with the local municipality, emergency services, VTrans, and GMR. Use of flaggers, road signs, construction barricades, and similar traffic control devices will be designed,

maintained, and operated as required by applicable regulations, including the Manual of Uniform Traffic Control Devices. Wironen pf. at 9.

308. TDI-NE will establish staging and storage areas along the Project route. These areas will serve as parking areas for construction worker vehicles and will limit the distance construction vehicles must travel during peak traffic periods to pick up or drop off material and equipment. Wironen pf. at 9.

Construction Practices

309. Construction workers will be dispersed throughout the Project area where work occurs. As a result, the number of construction vehicles at any one location should not add noticeably to overall traffic. Construction-related vehicles parked within roadway ROWs should not affect any existing parking resources in the vicinity of the Project. Construction vehicles supporting transmission line installation activities in roadway ROWs will be parked within construction zones, but the construction zones will be managed in accordance with a Maintenance and Protection of Traffic ("MPT") plan that will identify procedures to be used to maintain traffic and provide a safe construction zone for those activities within the roadway ROW. The MPT plan will also maintain sufficient parking and access at all times. Jessome Panel pf. at 48.

310. The Project will require a Section 1111 Permit from VTrans that will address construction practices along the state ROWs. TDI-NE has entered a Lease Option Agreement regarding the state highway and railroad ROWs. Jessome Panel pf. at 60-61; Jessome Panel supp. pf. at 19; exhs. TDI-JMB-13a, 13b, TDI-JMB-25.

311. TDI-NE has entered into host town agreements with Alburgh, Benson, and Ludlow that govern TDI-NE's use of their respective town roads for installation and operation of Project. Jessome Panel supp. pf. at 19; exhs. TDI-JMB-24a-c.

312. The general sequence for installing the underground transmission cables along the road and railroad ROWs will be as follows: i) survey, borings, and schedule/impact notifications; ii) environmental controls and clearing; iii) trench excavation and removal or storage of soils for backfill; iv) lay cable; v) backfill and install protection plate and warning tape; vi) compact and resurface; and vii) site restoration. Jessome Panel pf. at 33.

313. Construction over the overland portion of the NECPL was designed to install the cable off the traveled way (or travel lane), in what is commonly referred to as the roadway clear zone or safety zone. Construction in this area will allow the cable trench to be off the paved roadway, providing a buffer between the trench and traveling public. This buffer will also be used for construction access. Installation within the shoulder and clear zone of roadways will also minimize or eliminate existing potential hazards for motorists such as rock outcrops. Wironen pf. at 7; exh. TDI-AW-3 (revised).

314. Temporary staging areas to support overland installation activities will be located in proximity to the roads in areas that require minimal alterations such as flat fields. Additional temporary workspace will also be required at HDD and Jack-and-Bore staging areas. If additional workspace outside the road ROWs is required, previously disturbed areas or undeveloped areas will be utilized where feasible in order to minimize impacts. The Project will utilize two types of staging areas, construction staging areas and storage staging areas.

i. Construction staging areas are work areas adjacent to the trenching, Jack-and-Bore, or HDD installation work locations. A typical construction staging area in a roadway ROW would be approximately 20 to 50 feet wide along one side of the roadway. Staging areas for Jack-and-Bore and HDD operations will vary in area based on the size of the equipment and topography. If necessary, TDI-NE will seek landowner consent through short-term agreements to utilize private property for temporary construction staging areas. TDI-NE has already secured agreements to allow for temporary off-ROW construction staging areas at multiple locations.

ii. Temporary storage-staging locations are designated areas where vehicles, supplies, and construction equipment are positioned for access and use in support of construction activities. TDI-NE's properties in Alburgh, Benson, and Ludlow have been designated as storage-staging locations.

Jessome Panel pf. at 34-36.

Impacts on Roadways

315. Other than oversized loads, TDI-NE anticipates that all construction equipment and materials and all converter station equipment can be transported to the Project locations on local and state roads without requiring special road or bridge modifications. Jessome Panel pf. at 49.

316. The Project route will cross various paved municipal and state roads. Where crossings are required, TDI-NE will utilize HDD or Jack-and-Bore to pass under these roads. Jessome Panel pf. at 47.

317. Some of the roads along the overland route are primarily used for through-traffic, while other roads have residences adjoining the ROW. Installation of the transmission line and the presence of construction work areas and equipment will result in temporary disturbances to surrounding land uses during the construction period, including lane closures and other traffic management measures. At any given location, the active construction zone is expected to last for a maximum period of five days, except where TDI-NE encounters very significant rock formations, in the case of HDDs, or other unexpected delays. Jessome Panel pf. at 46-47; Wironen pf. at 8.

Oversized Equipment

318. TDI-NE will establish a logistics plan with the responsible manufacturer to address transport of the large power transformers ("LPTs") for the converter station and cable reels for the transmission line. Jessome Panel pf. at 48.

319. The transmission line cable is expected to be manufactured in Huntersville, North Carolina, and transported over roads to installation sites on specially designed trailers that can properly distribute and move the weight while minimizing vertical height. Cable delivery sections will be approximately 2,300 feet in length and mounted on a standard ST-36 steel drum. The combined weight of the drum and cable will be 26.4 US tons. The approximate vertical height will be 15.5 feet. Jessome Panel pf. at 48.

320. TDI-NE will seek VELCO's input on the local road segment, as VELCO previously transported large power transformers to the same area for the Coolidge substation. LPT and cable reel transport will also require special permits and routes from the transportation agencies

of each state on the route, including VTrans. In addition, transporting LPTs and cable reels on the road can require temporary road closures due to traffic issues, as well as coordination with local officials and police to redirect traffic. Jessome Panel pf. at 49.

321. Oversize and overweight deliveries will be scheduled during non-peak and night-time hours. When work along a road segment requires extended traffic interruptions, oversized/overweight deliveries will be scheduled during night-time hours within the limits of the approved permits. Wironen pf. at 9-10.

Aquatic Impacts

322. During installation activities, the presence and operation of the transmission cable installation vessels will result in additional vessel traffic on Lake Champlain. Installation vessels will include a 100 x 300-foot sectional lay barge and six 165 x 44-foot supply barges built to transit the Lake Champlain locks. These supply barges will transport 1,270 tons of cable in static tanks from a freighter in Port Elizabeth, New Jersey, and will make approximately 12 trips to and from the lake over the course of the installation. Jessome Panel pf. at 45.

323. In the aquatic portion of the Project, portions of the lake will be designated as off-limits to the public for short periods of time because the installation will occur at a rate of 1.4 to 7.8 miles per day. Boaters and other recreational lake users will not be prohibited from lake use due to vessel operations required for Project construction in the lake. An Aquatic Safety and Communications Plan will be prepared, US Coast Guard ("USCG") regulations will be followed, and a "Notice to Mariners" will be provided to waterway users through the USCG. Jessome Panel pf. at 80; Murphy pf. at 30-31.

324. For the in-water portion of the Project, transport of the transmission cables will occur via supply barges. Other equipment, materials, and supplies will be transported to the work site by local barges and support vessels. An approximately 60,000-square-foot, temporary storage area on land might also be required to support installation of the cables in Lake Champlain. If this storage area is needed, it is anticipated that an existing commercial marine facility within Vermont with docking, hoist capacity, and storage space can be utilized. Jessome Panel pf. at 45.

325. Given the limited traffic associated with the lake installation, and the slow speeds of the supply and installation vessels, it is expected that the Project will not prohibit any water-dependent commercial or recreational activities, including boating, angling, water sports, or commercial sightseeing, because vessels could easily transit around the limited area of the work site. Vessel traffic will be temporary, present only for the duration of construction, and will be localized to the work site. Jessome Panel pf. at 45.

326. Depending on the installation technique deployed, approximately 1.4 miles (shear or jet plow) to 7.8 miles (bottom lay) of transmission cables can be installed per 24-hour day in an aquatic environment. As a result, the immediate work site, which will be off limits to other vessels, will remain at any given location for a reasonably short period of time due to installation vessel speed. Jessome Panel pf. at 46.

327. All transmission cable installation activities will be closely coordinated with the commercial ferry operator with the goal of scheduling cable installation around planned maintenance cycles, if possible. TDI-NE will also closely coordinate lake installation activities with the USACE, the USCG, harbor masters, commercial vessels, local maritime associations, marinas, and other local, state, and federal agencies, as necessary, to minimize or avoid impacts to the extent practical. Additionally, an Aquatic Safety and Communications Plan will be provided to the USCG that includes notifications to local waterway users regarding timing of the transmission cable installation activities. Jessome Panel pf. at 46.

Educational Services

[10 V.S.A. § 6086(a)(6)]

328. The Project will not cause an unreasonable burden on municipalities to provide educational services. This finding is supported by findings 329 through 331, below.

329. The construction phase of the Project is expected to last three years. Few, if any, of the temporary construction workers and their families are likely to move to the area due to the Project because the Project is linear and work will occur across 154 miles of the state. Jessome Panel pf. at 80.

330. Once operational, on average, 22 full-time employee equivalents ("FTEs") will be needed each year to operate, inspect, and maintain the Project and ensure compliance with permits and other regulatory requirements. Even if all FTEs were new to Vermont and located in one town such as Ludlow, this number of FTEs would not be expected to appreciably change the number of students in the public school system over existing levels. Jessome Panel pf. at 80.

331. TDI-NE has notified the towns along the Project route, and there have been no concerns expressed regarding an unreasonable burden on educational services. Jessome Panel pf. at 81.

Municipal Services

[10 V.S.A. § 6086(a)(7)]

332. The Project will not place an unreasonable burden on local governments to provide municipal or governmental services. This finding is supported by Findings 333 through 336, below.

333. The transmission line will require no extra or unusual municipal services in any of the towns along the Project route. Jessome Panel pf. at 81.

334. Construction of the cable will be transient in nature, similar to road projects, and therefore will not place a burden on municipalities. Jessome Panel pf. at 81.

335. With respect to the proposed converter station, existing fire and emergency services that already cover the VELCO substation should be capable of handling any issues that arise. TDI-NE will consult with local emergency service agencies prior to operation of the converter station with instructions and a mechanism for accessing the converter station site in the event of an emergency. The Town of Ludlow indicated via a questionnaire that there would be no impact to the town's municipal services as a result of the Project's construction or operation. Jessome Panel pf. at 81; exh. TDI-JMB-17.

336. The Benson Agreement and Ludlow Agreement address the provision of emergency services for the Project and the reimbursement of costs by TDI-NE. Jessome Panel supp. pf. at 11-13; exhs. TDI-JMB-24b, c.

Aesthetics, Historic Sites, and Rare and Irreplaceable Natural Areas

[10 V.S.A. § 6086(a)(8)]

337. The Project will not have an undue adverse effect on the scenic or natural beauty of the area, aesthetics, historic sites, or rare and irreplaceable natural areas. This finding is supported by findings 338 through 36, below.

Aesthetics

338. The installation of the Project transmission line underwater and underground, rather than overhead, will eliminate visual impacts of the transmission cables. Jessome Panel pf. at 82.

339. Minimal above-ground infrastructure will be associated with the transmission cables; that infrastructure will be limited to at-grade access covers and the attachment of the cables to a bridge and culvert headwall at two stream crossings. Jessome Panel pf. at 82.

340. The converter station in Ludlow will be minimally visible from off-site locations due to intervening vegetation, topography, and a setback of approximately 400 feet from the closest public road. In areas where trees or other vegetation will be removed, the Petitioners will reestablish buffers through landscape mitigation plantings. Jessome Panel pf. at 82; exh. TDI-JMB-8a.

341. To the extent there are any adverse impacts, they will be restricted to the potential view of the converter station from a distance of approximately 500 feet, for less than 100 feet along Nelson Road at or near the access road entrance. Landscape mitigation plantings will narrow the width of the clearing and screen and soften views of the converter station. Buscher pf. at 10; exh.TDI-MB-2 (Appendix B).

342. The converter station site is adjacent to a major high-voltage transmission corridor with two major overhead transmission lines and in close proximity to the VELCO Coolidge substation. Buscher pf. at 11; exh.TDI-MB-2.

343. Cleared areas associated with construction have been minimized to the extent possible and will be re-seeded and re-vegetated after construction. New permanently cleared areas that are required to prevent deep-rooted trees from affecting Project operations will be avoided to the extent possible. Jessome Panel pf. at 82.

344. Thirteen specific locations were identified at which adverse impacts may occur as a result of vegetation removal for the construction and maintenance of the cable route. At these locations, the cable route could require clearing that may result in removal of vegetation that currently provides screening and landscape value, including landscape plantings between the road and adjacent developments. At six of the thirteen locations, TDI-NE has proposed to make additional efforts to avoid clearing. At all locations that may be affected, TDI-NE will implement mitigation measures to supplement or replace any screening affected by the Project. Buscher pf. at 9; exh.TDI-MB-2; exh. TDI-JMB-19a.

345. Portions of the Project will require clearing that removes an established edge to existing wooded areas. In some locations along the cable route, up to 50 feet of clearing will be required and the new edge of woods will have a different character. Where clearing creates a new edge along roads that the Project follows, the new edge will include trees with branching confined to the very tops of the trees and minimal understory plantings. This is a temporary impact and will be naturally mitigated over time as new understory plantings and foliage are generated along the edge. Buscher pf. at 9-10; exh.TDI-MB-2.

346. The Project will not violate any clear, written community standard intended to preserve the aesthetic or scenic beauty of the areas in which the Project will be sited. All relevant town and regional plans along the overland route were reviewed for the Project. Only the Northwest Regional Plan and Shrewsbury Town Plan include standards regarding energy transmission facilities. By burying the cable within existing road and railroad ROWs and avoiding significant tree and vegetation clearing, the Project is consistent with the standards contained in those plans. Buscher pf. at 12; exh.TDI-MB-2.

Historic Sites

347. The Project will not have an undue adverse effect on historic sites. This finding is supported by findings 348 through 359, below.

348. The Petitioner has performed phase IA archaeological assessments along the overland route and aquatic route. The Petitioner has also investigated potential extant historic structures along the overland route. This information will be utilized to determine what additional studies

might be needed prior to construction. Kristin Heitert, TDI-NE ("Heitert") pf. at 2; Stephen Olausen, TDI-NE ("Olausen") pf. at 3; Christopher R. Sabick, TDI-NE ("Sabick") pf. at 2; exhs. TDI-KBH-2, TDI-SAO-2, TDI-SAO-3, TDI-CRS-2.

349. The phase I assessments investigated the likelihood of impacts to known and potential cultural resources along the 50-foot wide Project corridor. The assessments allowed the archaeological consultant to propose potential alternative routes in some locations and to point out areas of particular concern where there are historic structures within Lake Champlain at or near the proposed NECPL corridor. Sabick pf. at 3; exh. TDI-CRS-2.

350. The phase I assessments involved the review of previously collected remote sensing data and archaeological reports of structures located along the Project corridor. Sabick pf. at 4; exh. TDI-CRS-2.

351. There are three known historic resources that stretch across Lake Champlain – the Rouses Point Train Trestle Bridge, the Larrabees Point-Willow Point Train Trestle, and the Revolutionary War Great Bridge between Mount Independence, Vermont, and Ticonderoga, New York. The Petitioner intends to avoid or minimize the Project's effect on these historic resources. Sabick pf. at 4.

352. Sonar investigation has identified three unverified objects on the bed of Lake Champlain within 40 meters of the Project. These objects have not been identified as cultural in nature. If the Project cannot be constructed to avoid these three objects, then additional study will be completed to determine if they are cultural resources. Sabick pf. at 4.

353. The Petitioner has identified archaeologically sensitive areas along approximately 11.6 linear miles (21%) of the Project and in several of the proposed work parcels in Alburgh, Benson, and Ludlow, Vermont. The Petitioner has also identified three previously recorded pre-contact sites, one previously recorded post-contact site, and four field-identified archaeological resources consisting of nineteenth-century residential and outbuilding foundation remains. Heitert pf. at 5; exh. TDI-KBH-2.

354. The Petitioner will conduct phase IB archaeological surveys in areas with moderate-to-high archaeological sensitivity that will be affected by the Project. If any archaeological resources are discovered and determined eligible for listing on the national

register and cannot be avoided during Project construction, the Petitioner will mitigate any adverse effects. Mitigation activities may include, but are not limited to, phase III archaeological excavations. Heitert pf. at 6; exh. TDI-KBH-2.

355. The Petitioner conducted a historic architectural reconnaissance survey to identify known and potentially significant historic architectural resources within the vicinity of the Project, and assessed the Project's effects on those resources that are listed or eligible for listing in the national and state historic registers. Olausen pf. at 2; exh. TDI-SAO-2, SAO-3.

356. Fifty-seven properties were surveyed. Three properties in the Project study area are listed in the national register, 16 are listed in the state register, and four were evaluated as potentially eligible for listing on either the national or state historic register. Olausen pf. at 6; exh. TDI-SAO-2, SAO-3.

357. Based on the results of the survey, the construction of the transmission line and the converter station will have no adverse direct or indirect effect on any of the historic architectural resources because the transmission line will be installed almost entirely within ROWs and the converter station will be constructed on an undeveloped wood parcel that has heavy white pine screening on all sides and will not be visible to or from any historic property. Olausen pf. at 8-9.

358. The Petitioner has acquired two properties that are listed in the state historic register: the S. Mott House on Bay Road in Alburgh, and the Augustus G. Fullam House on Nelson Road in Ludlow. The Mott House is vacant and on property owned by the Petitioner that is to be used for the transition of the cable route from land to Lake Champlain. The Fullam House is on property owned by the Petitioner that is directly adjacent to the converter station site, and the station's access road will run through the property. Plans for the future disposition of these properties have not yet been developed. Olausen pf. at 9.

359. The conditions in the DPS/ANR/DHP Stipulation adequately address any outstanding issues with regard to archeological and historic resources along the in-lake and overland portions of the Project and fulfill the recommendations of the archeological and historic consultants. Provided that TDI-NE implements these conditions, the Project will not cause undue adverse impacts on archaeological or historic resources. Heitert supp. pf. at 2; Olausen supp. pf. at 2; Sabick supp. pf. at 2.

Rare and Irreplaceable Natural Areas

360. The Project will not result in any undue adverse impacts on rare and irreplaceable natural areas ("RINAs"). See findings 361 through 366, below.

361. Several potentially significant natural communities were identified along the overland component of the proposed Project that may be considered RINAs. The Project is designed to protect potentially significant natural communities. Jessome Panel pf. at 86; Nelson(2)[17] pf. at 11; exhs. TDI-JAN-13a-f (formerly labeled TDI-GGM-2 to 7).

362. TDI-NE conducted natural-community evaluations for the overland portion of the proposed Project to evaluate any impacts of the Project on potential RINAs during the 2014 growing season. The evaluations included desktop and field investigations. Nelson(2) pf. at 4; exhs. TDI-JAN-13a-f.

363. Only one rare (Rank S1) likely significant natural community was identified during natural resource investigations, and it will be avoided. Nelson(2) pf. at 9; exh. TDI-JAN-13a.

364. The Petitioner has proposed construction, including tree-clearing, within several uncommon (Rank S3) and widespread (Rank S4) potential and likely significant forested natural communities that were identified during natural resource investigations. These impacts will be located along the edge of the existing cleared and actively maintained Route 4 corridor, thereby minimizing impacts on the forest interior and the overall communities. The Project-related impacts adjacent to Route 4 will have a negligible effect and will not affect the quality of these natural-community occurrences. Jessome Panel pf. at 86; Nelson(2) pf. at 10-11; exhs. TDI-JAN-12.

365. The Petitioner will remove trees at four areas containing the potentially significant Mesic Maple-Ash-Hickory-Oak Forest natural communities adjacent to Route 4 to accommodate construction equipment access and work activities. The total area of tree removal at these four locations will be 2.1 acres, which represents less than 1 percent of the area of communities affected by this activity. Additionally, approximately 2.59 acres of tree removal will be required

17. "Nelson(2)" refers to the prefiled direct testimony of Galen Guerrero-Murphy which was adopted in its entirety by Jeffrey Nelson through his supplemental testimony.

within four locations containing potentially significant Dry Oak-Hickory-Hophornbeam Forest, Temperate Hemlock Forest, Temperate Hemlock-Hardwood Forest, and Mesic Red Oak-Northern Hardwood Forest occurrences on Route 4 to accommodate construction equipment access and work activities. Nelson supp. pf. at 22; exhs. TDI-JAN-3 (revised), TDI-JAN-12 (revised), TDI-JAN-13a.

366. Areas affected by tree removal and construction disturbance will be allowed to regenerate to pre-construction conditions and restored in accordance with the EPSC plan. Post-construction monitoring and control of non-native invasive species will be completed in accordance with TDI-NE's vegetation management protocol. The proposed Project-related impacts adjacent to Route 4 will have a negligible effect and will not affect the quality of these natural-community occurrences. Nelson(2) pf. at 10; exhs. TDI-JAN-1 (revised), 13a.

Wildlife, Including Necessary Wildlife Habitat and Endangered Species

[10 V.S.A. § 6086(a)(8)(A)]

367. The Project will not destroy or significantly imperil necessary wildlife habitat or endangered species ("RTE species"). This finding is supported by findings 368 through 387, below.

Generally

368. TDI-NE conducted necessary wildlife habitat assessments and RTE species surveys along the overland portion of the proposed Project during the 2014 growing season, including desktop and field investigations, in consultation with VFWD and ANR. Murphy pf. at 14; Nelson(2) pf. at 13; exhs. TDI-JAN-13a-f, TDI-SM-4.

369. Due to co-location within existing roads and railroad ROWs, it is not expected that construction-related noise will affect wildlife that may be utilizing nearby habitat. Nelson(2) pf. at 21.

370. With the implementation of the avoidance, minimization, and protection measures included in this Order, the Project will not have an undue adverse impact on wildlife population and will not destroy or imperil necessary wildlife habitat. Nelson(2) pf. at 22.

Lake Champlain

371. TDI-NE has not identified any previously designated necessary wildlife habitat in Lake Champlain that would intersect with the Project route. Murphy pf. at 26.

372. As of November 17, 2014, there was no designated "essential fish habitat" on the National Oceanic and Atmospheric Administration's Essential Fish Mapper site, and there are no federally listed aquatic species along the Project route. Murphy pf. at 26.

373. The DPS/ANR/DHP Stipulation requires TDI-NE to adjust the cable's location and burial method in Lake Champlain to avoid fish spawning reefs and shoals and to limit route clearing and cable installation between MP 1 and MP 74 to June 1 to October 1, and to June 1 to December 31 for the area between MP 74 and MP 98. Murphy supp. pf. at 4; exh. TDI-JMB-19a.

374. Ten aquatic RTE plant species Element Occurrences ("EO") and 17 aquatic RTE animal species EOs are listed in the vicinity of the Project based on the Vermont Natural Heritage Inventory database. Murphy pf. at 24; exhs. TDI-JAN-13a, b.

375. Based on consultation with the VFWD, the only in-water survey determined to be necessary was related to rare mussel species in the northern section of the Project route. Surveys for sensitive mussel species were completed on behalf of TDI-NE for five RTE freshwater mussel species suspected to occur in the northern section of the Project route. Diver surveys were conducted every one-half mile along the cable route until water depths increased to greater than 30 feet. No live Vermont RTE mussel species were observed, and the live common mussels found at only three of the 24 sites surveyed were sufficiently covered in zebra mussels that field staff did not believe that they would survive the year. Based on these results, the VFWD concurred in September of 2014 that these species are not likely to be persisting within the Project area and that no further work was required. Murphy pf. at 14; exh. TDI-SM-4.

376. A review of existing information indicated that all RTE plant species identified in the vicinity of the route were found within bays that will be avoided by the installation. The survey program also noted that RTE species that occupy the nearshore waters would be avoided through the use of HDD installations. Murphy pf. at 24.

Deer

377. The Petitioner identified and surveyed five potential deer wintering areas ("DWAs") that will be in proximity to the Project. The Project will avoid tree removal in all potential DWAs with the exception of one limited area immediately adjacent to Route 103 from approximately mile posts 140.7 to 140.9. In this area, a 10- to 30-feet-wide swath of trees adjacent to Route 103 will be removed. This will include approximately 0.32 acres that will be allowed to revegetate and 0.29 acre of permanent tree removal. No adverse impacts to this potential DWA will occur as a result of this limited tree removal along an existing highway corridor. Nelson(2) pf. at 19-20; TDI-JAN-13a.

Bear

378. The Project will be installed alongside Route 103 at the Mount Holly/Ludlow town border where a potential bear travel corridor is located. Limited tree removal will be performed along Route 103 in this area to install the cable within the VTrans ROW – generally, no more than a 20-foot-wide area of tree removal along the existing, cleared ROW. Much of this area will be allowed to revegetate. This limited tree removal will not affect critical bear habitat. Additionally, the temporary construction activities will not significantly impede movement of black bear during construction, especially relative to pre-existing traffic in the area, nor will the Project have a permanent effect on the travel corridor. Nelson(2) at 20-21; TDI-JAN-13a.

Plants

379. Habitat assessments and surveys for RTE species of plants were completed in 2014. As a result of these investigations, 53 species of uncommon and RTE plant species were observed, including three state-endangered and six state-threatened plants. Nelson(2) pf. at 14; exh. TDI-JAN-13a.

380. All threatened and endangered plants will be avoided, but six rare plants occurring in a total of 20 distinct rare plant populations will be affected by the Project as currently proposed. TDI-NE's resource experts have developed protection measures to ensure that no undue, adverse

effects on the rare plant species occur as a result of the Project. Robert Popp, ANR ("Popp") pf. at 6; Nelson(2) pf. at 16-17; exh. TDI-JAN-13a.

381. Impacts on these six rare plant species will be confined to areas along existing road corridors, primarily within actively mowed and maintained areas in the VTrans ROW. Species-specific protection measures, including construction, restoration, and post-construction measures, have been proposed to ensure that there is no undue, adverse impact on the six rare plants species as a result of the Project. Nelson(2) pf. at 16; Nelson supp. pf at 20; exh. TDI-JAN-13a.

Indiana Bat

382. The Indiana bat is an RTE species that could be affected by the construction of the Project. Scott Darling, ANR ("Darling") pf. at 7.

383. Based on consultation with VFWD, a habitat assessment for the Indiana bat was conducted by TDI-NE to identify potential roosting trees for avoidance and/or further study. The Project study area identified 116 potential roosting trees for the Indiana bat. As a result, protective measures, including avoidance of all known Indiana bat roosting trees, were incorporated into the Project design. Nelson(2) pf. at 13-14, 17-18; exhs. TDI-JAN-13e; TDI-JAN-3 (revised); TDI-JMB-19a.

384. If endangered bats are present, potential roost trees must be avoided unless the VFWD reviews the survey data and tree characteristics and determines that a tree may be felled during the hibernation period of November 1 through April 15. Darling pf. at 5-12.

385. As part of the DPS/ANR/DHP Stipulation, TDI-NE has committed to flagging all 116 potential roosting trees and alerting construction staff to the meaning of the flags. If there are changes to the Project that could impact potential roosting trees, TDI-NE will conduct surveys of impacted trees. TDI-NE may remove potential roosting trees that surveys indicate are not in use, under certain proscribed conditions. Nelson(2) pf. at 13-14, 17-18; exhs. TDI-JAN-13e; TDI-JAN-3 (revised); TDI-JMB-19a.

Reptiles

386. The Project's construction route traverses portions of the known habitats of certain reptiles, including the timber rattlesnake, the eastern ratsnake, the ribbonsnake, the wood turtle, and the eastern musk turtle. Blodgett pf. at 6.

387. The DPS/ANR/DHP Stipulation includes a revised avoidance and mitigation plan for specific reptile species that will include the following provisions: (i) a step-by-step methodology to address potential encounters; (ii) multiple daily inspections by a trained herpetologist; (iii) weekly inspection reports submitted to the VFWD; (iv) a continuously on-site trained herpetologist for construction between MP 103 and MP 110; and (v) identification of target areas for species other than the timber rattlesnake. Nelson pf. supp. at 22; exh. TDI-JMB-19a.

Development Affecting Public Investments

[10 V.S.A. § 6086(a)(9)(K)]

388. The Project will not unnecessarily or unreasonably endanger the public or quasi-public investment in adjacent public facilities, services, or lands, or materially jeopardize or interfere with the function, efficiency, or safety of, or the public's use or enjoyment of or access to public facilities, services, or lands. This finding is supported by findings 389 through 394, below.

389. The public investments that could be affected by the Project include: (i) Lake Champlain; (ii) public road and railroad ROWs that the Project will utilize or cross; (iii) conserved public lands adjacent to or in close proximity to the Project, including Blueberry Hill Wildlife Management Area, Mount Independence, the Appalachian Trail Corridor and Green Mountain National Forest Trail, and Okemo State Forest; (iv) streams and rivers that will be crossed; (v) nine recreational areas within 500 feet of the Project route, four of which are located on the shoreline where the cables will be installed in Lake Champlain; and (vi) two fishing areas in the southern part of the lake. Wironen pf. at 12-13; exh. TDI-AW-4.

390. No adverse impacts on these public investments are anticipated. During installation of the lake and overland portions of the Project, there may be some impacts on existing vessel and traffic patterns. These impacts will be localized and of a relatively short duration, so there will be no material disruption in the public's use and enjoyment. After construction is completed, the

construction area will be restored and the only indication of the presence of the transmission system will be the permanent Project corridor along the overland road and railroad ROWs. Wironen pf. at 13.

391. Water quality impacts due to cable installation in Lake Champlain will be of limited duration and will meet the applicable Vermont Water Quality Standards. Jessome Panel pf. at 89; Murphy pf. at 20; Thuman pf. at 15.

392. During operations, impacts on public investments will be either non-existent or very minimal, given the placement of the transmission line underwater and underground and the design and siting of the converter station. Jessome Panel pf. at 89.

393. A number of public investments will be enhanced by the Project, including the following:

i. The two Lake Champlain funds will provide significant money over a 40-year time period that can be used to help ameliorate Lake Champlain's phosphorous pollution and conduct habitat restoration or other lake enhancement projects that are unrelated to the Project. Jessome Panel pf. at 90; exh. TDI-JMB-6 (revised).

ii. Restoration of an eroded bank on Lake Champlain on TDI-NE's property in Benson due to existing conditions. Jessome Panel pf. at 77.

iii. Funding of a new public boat ramp at the Fish and Wildlife Access Area in Alburgh. Jessome Panel supp. pf. at 15; exh. TDI-JMB-26.

iv. Water quality improvements may be attained via culvert replacement, ditch enhancements, and bank stabilization. Jessome Panel pf. at 89.

v. Town roads are expected to be improved after the cable installation through new material and grading. Jessome Panel pf. at 89; exh. TDI-JMB-24b.

vi. The provision of excess fiber optic cable to VTrans to assist in the buildout of the state's telecommunications infrastructure. Jessome Panel supp. pf. at 17; exh. TDI-JMB-25.

394. TDI-NE is currently planning 29 HDDs along the entire terrestrial route, representing approximately 5.4 miles of drills. HDDs include management of excavated soils, which will be temporarily stored on site during construction, and will either be used to restore the site to its previous grade once the drilling process has been completed, or be removed and disposed of at an approved location. Jessome Panel pf. at 41.

Integrated Resource Planning

[30 V.S.A. § 248 (b)(6)]

395. TDI-NE is not an electric distribution utility, will not directly serve retail or wholesale electric customers in Vermont through the Project, and is not required to prepare a least cost integrated plan under 30 V.S.A. section 218c.

Comprehensive Energy Plan

[30 V.S.A. § 248 (b)(7)]

396. On October 14, 2015, the Department filed a letter, pursuant to 30 V.S.A. §202(f), stating that the Department had determined that the Project is consistent with the Vermont Electric Plan provided that TDI-NE's actions are consistent with the evidence filed by TDI-NE in this case. Letter from Bill Jordan, Director of Engineering for the Vermont Department of Public Service, to Susan M. Hudson, Clerk of the Board, dated October 14, 2015.

Waste-to-Energy Facilities

[30 V.S.A. § 248(b)(9)]

397. The Project is not a waste-to-energy facility; therefore, this criterion is not applicable.

Existing or Planned Transmission Facilities

[30 V.S.A. § 248 (b)(10)]

398. The Project can be served economically by existing or planned transmission facilities without undue adverse effect on Vermont utilities or customers. This finding is supported by findings 101 through 120, above under 248(b)(3) and findings 399 through 402, below.

399. TDI-NE is proposing to interconnect at VELCO's existing Coolidge substation. Jessome Panel pf. at 92; Eng pf. at 4.

400. The ISO-NE studies for the Project are still in progress, so no final determinations have been made concerning the precise equipment needed for interconnection at the Coolidge substation or any potential system upgrades of either the VELCO system or transmission

facilities owned by other entities in Vermont or elsewhere in New England. Jessome Panel pf. at 92; Eng. pf. at 14.

401. Any upgrades to the subtransmission and transmission systems that are necessitated by the Project will be borne entirely by TDI-NE. Jessome Panel pf. at 92; Eng pf. at 14; exh. TDI-JMB-22.

402. The Project can be economically served by the combination of existing transmission facilities and the upgrades that will be determined by the SIS, without undue adverse effect on Vermont utilities or customers. Eng pf. at 22.

The General Good of the State

[30 V.S.A. § 248(a)(2)]

403. The Project will promote the general good of the state of Vermont. This finding is supported by the findings under each of the Section 248(b) criteria, above, and findings 404 through 409, below.

404. Construction and operation of the NECPL will have significant economic, environmental, and electric system benefits for the state of Vermont and the New England region. Jessome Panel pf. at 21.

405. Potential environmental benefits include supporting state and regional renewable energy goals, replacing existing electricity generated by fossil fuels and thereby reducing greenhouse gases by millions of tons per year, supporting Lake Champlain cleanup and restoration efforts, and providing a major source of electricity without above-ground aesthetic impacts along the route. Jessome Panel pf. at 21.

406. The Project will enhance the region's fuel diversity to the extent it brings hydroelectric, wind, or other renewable energy, as defined under Vermont law, to New England, and will strengthen and diversify the Vermont electric grid. The buried cable infrastructure will also be protected from natural disasters, and will have "black start" capability that can quickly restart the electric grid in the event of a blackout. Jessome Panel pf. at 21; exh. TDI-JMB-20.

407. TDI-NE has proposed several funds and payments in support of the Project that will bring significant economic and public good benefits to Vermont ratepayers, renewable energy

programs, and Lake Champlain cleanup efforts. Jessome Panel pf. supp. at 16; Singer supp. pf. at 3-5; exh. TDI-TS-4 (revised).

408. 1n addition to the above public good benefit funds, TDI-NE will also be making additional direct payments to state and local entities, including taxes, license, and lease payments. Jessome Panel supp. pf. at 15; Singer pf. supp. at 5-8; exh. TDI-TS-3 (revised).

409. The total value of the public benefit payments and other Project payments through construction and operation over the 40-year life of the Project is $1.935 billion. Singer pf. supp. at 9; exh. TDI-TS- 4 (revised).

Discussion

Pursuant to 30 V.S.A. § 248(a)(2), no company or person may begin site preparation for, or commence construction of, an electric transmission facility unless the Board first finds that such a facility will promote the general good of the state and issues a certificate of public good to that effect. This requires that the Board review the findings under each of the criteria contained in Section 248(b) and ultimately determine whether the benefits of the Project outweigh the impacts. As this Board has previously explained:

> In essence the factors enumerated in subsection (b) are "conditions precedent" to the ultimate conclusion that a proposal is consistent with the general good of the state, rather than being full proof of that conclusion. In other words, they are necessary, but they may not be sufficient.[18]

In this Order, we make positive findings under all of the criteria of Section 248(b). By siting the Project under Lake Champlain and burying it beneath existing rights-of-way, TDI-NE has chosen a route that reduces the aesthetic and land-use burdens that typically cause substantial public concern about new transmission infrastructure. These factors weigh heavily in favor of the Project being in the general good of the state.

Nonetheless, the Project is significant in scope, and TDI-NE's plans will result in the proposed cable remaining under Lake Champlain and underground. The installation of the

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18. *Application of twenty-four electric utilities for a certificate of public good authorizing execution and performance of a firm power and energy contract with Hydro-Quebec and a Hydro-Quebec Participation Agreement*, Docket No. 5330, Order of October 12, 1990, at 46.

Project under Lake Champlain, if not done carefully and in accordance with the plans submitted by TDI-NE and subject to the conditions described in this Order, has the potential to cause harm to the lake and its natural communities. The Project will also cause a temporary but very real disruption of travel on some of the state's highways and host town roads. These burdens are not taken lightly and should only be incurred for good cause.

Based upon our review of the petition and the settlement agreements reached among the parties, we find that the Project will provide significant benefits in excess of these burdens. These benefits include but are not limited to the potential to help Vermont and New England meet the need for diversified sources of renewable power; $263 million for pollution abatement and restoration of Lake Champlain; $211.8 million in direct lease payments to VTrans; $750,000 to study and develop a commercially viable renewable energy generation solution in the BED service territory; significant property tax payments to the state and host towns; significant investments in infrastructure in Alburgh and Benson; and the potential for decreased electric rates for consumers. In addition, the Petitioner has made numerous commitments in the various memoranda of understanding to mitigate the burdens associated with the Project. The Board has relied on the Petitioner's commitment to comply with the terms of those agreements in determining that the benefits of the Project outweigh its burdens. Accordingly, the Board has conditioned its approval of the Project upon the Petitioner fulfilling the commitments that it has made.[19] In conclusion, based on these benefits and based on all of the findings under each of the Section 248(b) criteria, we find that the Project will promote the general good of the state.

V. COMPLIANCE FILINGS AND POST CERTIFICATION PROCESS

Procedure for Reviewing Compliance Filings Required by the CPG

As a result of the conditions of approval contained in this Order and the various memoranda of understanding, the Petitioner is obligated to make numerous post-certification filings. Unless otherwise stated, such filings must be made with both the Board and the parties to this case. Unless otherwise stated, when a filing is received, all parties entitled to receive such filing shall have fifteen business days to submit to the Board written comments regarding the

19. *See e.g.,* Order paragraphs 3-4, below.

filing, with copies sent to the Petitioner and the parties. All requests for an extension of time to review any post-certification filing shall be submitted to the Board within ten business days of the date the filing was made.

In the event that a party feels it is necessary for the Board to conduct further inquiry or process regarding a post-certification filing, then the party must include in its comments a clear statement of the relief requested and the grounds supporting such relief. The Board will conduct further investigation or process only where it finds that the post-certification filing raises a significant issue or for other good cause.

Procedure for Reviewing Changes to the Design of the Project

As part of our approval of the Project, the Petitioner is required to file for review and approval the final design of the Project.[20] In the event that changes to the Project are necessary after the Board has reviewed and approved these final designs, then the Petitioner shall file such changes with the Board and the parties. When notice of a proposed change is received, the parties shall have fifteen business days to submit to the Board written comments on the change. All requests for an extension of time to review any change shall be submitted to the Board within ten business days of the date the filing was made.

In the event that a party believes that a change described in the notice constitutes a substantial change pursuant to Board Rule 5.408, then the party must include in its comments a clear statement of the relief requested and the grounds supporting such relief. The Board will only conduct further investigation or process where it finds that the proposed change constitutes a significant change pursuant to Board Rule 5.408, or where other good cause exists.

VI. CONCLUSION

After examining the evidentiary record, we find that construction of the Project, subject to all of the conditions that we have discussed in this Order, will result in significant economic, environmental, and electric benefits for the state of Vermont. Furthermore, the evidence presented in this Docket has convinced us that the proposed Project can be constructed without

20. *See* Order paragraph 11, below.

undue adverse impacts on Vermont's natural and built environment and without presenting a risk to Vermonters' health and safety. Accordingly, we find that the Project will promote the general good of the state and the Petitioner's request for a CPG authorizing construction of the Project is granted.

VIII. ORDER

IT IS HEREBY ORDERED, ADJUDGED, AND DECREED by the Public Service Board of the State of Vermont that the proposed installation and operation of the New England Clean Power Link Project ("NECPL" or "Project"), including a 1,000 MW high-voltage DC ("HVDC") electric transmission line, a converter station, and other associated facilities by Champlain VT, LLC d/b/a TDI New England ("TDI-NE" or "Petitioner"), in accordance with the evidence and plans submitted in this proceeding, will promote the general good of the State of Vermont, and a certificate of public good to that effect shall be issued in this matter, subject to the following conditions:

General Conditions

1. Construction, operation, and maintenance of the proposed Project shall be in accordance with the plans and evidence as submitted in this proceeding. Any material deviation from these plans or a substantial change to the Project must be approved by the Board. Failure to obtain advance approval from the Board for a material deviation from the approved plans or a substantial change to the Project may result in the assessment of a penalty pursuant to 30 V.S.A. §§ 30 and 247.

2. Petitioner shall obtain all municipal, state, and federal permits or other regulatory approvals that are required for the Project, and shall construct, operate, and maintain the Project in accordance with all conditions set forth in any such permits and approvals.

3. Petitioner shall comply with all terms and conditions of the following stipulations and agreements, the terms and conditions of which are incorporated herein by reference:

Agreement Between TDI-NE and Vermont Electric Power Company, Inc. and Vermont Transco LLC (together "VELCO") (12/4/14) and First Amendment (8/20/15)	Exhs. TDI-JMB-7, 7a

(collectively, "VELCO Agreement")	
Stipulation Among TDI-NE, the Department of Public Service ("Department" or "DPS"), Agency of Natural Resources ("ANR"), and the Vermont Division for Historic Preservation ("VDHP") (7 /17 /15) and First Amendment (7/29 /15) (collectively, "DPS/ANR/DHP Stipulation")	Exhs. TDI-JMB-19a-b
Stipulation Between TDI-NE and Conservation Law Foundation (5/29/15) ("CLF Agreement")	Exh. TDI-JMB-20
Stipulation Between TDI-NE and VELCO (7 /24/15) ("VELCO Stipulation")	Exh. TDI-JMB-21
Stipulation Between TDI-NE and Green Mountain Power Corporation ("GMP") (7 /17 /15) ("GMP Stipulation")	Exh. TDI-JMB-22
Stipulation Between TDI-NE and the City of Burlington Electric Department ("BED") (7 /28/15) ("BED Stipulation")	Exh. TDI-JMB-23
Town of Alburgh Host Town Agreement (6/2/15) ("Alburgh Agreement")	Exh. TDI-JMB-24a
Town of Benson Host Town Agreement (6/10/15) ("Benson Agreement")	Exh. TDI-JMB-24b
Town of Ludlow Host Town Agreement (7 /2/15) ("Ludlow Agreement")	Exh. TDI-JMB-24c

4. Petitioner shall comply with the conditions related to environmental resources specified in Attachment II of the DPS/ANR/DHP Stipulation.

5. Petitioner shall comply with the conditions related to historic resources specified in Attachment III of the DPS/ANR/DHP Stipulation.

6. Construction hours will be from 7:00 A.M. to 7:00 P.M. Monday through Friday and from 8:00 A.M. to 6:00 P.M. on Saturdays. All construction activities and related deliveries shall cease on Sundays and state or federal holidays. Petitioner may extend its construction hours as follows: (i) 24 hours per day seven days per week on Lake Champlain during the construction window as identified in Attachment II of the DPS/ANR/DHP Stipulation; (ii) extenuating circumstances, beyond the Petitioner's reasonable control, that necessitate after-hours work to protect public safety, worker safety, and/or the convenience of the traveling public; (iii) certain

horizontal directional drilling ("HDD") operations that may require extended hours in order to complete the operation; or (iv) other extensions to the schedule for good cause, provided the Board approves them in advance.

7. Blasting associated with construction of the Project shall only occur during the hours of 9:00 A.M. to 5:00 P.M., Monday to Friday, with no blasting permitted on federal or state holidays.

8. All blasting shall be carried out by licensed and certified blasting technicians. All blasting will be performed in accordance with Attachment II of the DPS/ANR/DHP Stipulation, the Project Blasting Plan, exhibits TDI-JMB-10 and JMB-10a, and any and all applicable laws and regulations, including but not limited to US Department of Interior Rules 816.61-68 and 817.61-68 and the Blasting Guidance Manual, Office of Surface Mining, Reclamation and Enforcement, US Department of Interior, to limit peak particle velocity and ground vibration to safe levels. Noise and air blast effects shall be limited through application of proper techniques, and blasting mats will be used where needed to limit the occurrence of flyrock.

9. Petitioner shall prepare a decommissioning plan and associated cost estimate for the Project's converter station as a pre-construction compliance filing pursuant to Condition 17, below. For the duration of the Project, Petitioner shall file with the Board and the Department each of the NECPL's transmission service contracts within 30 days of execution of such contracts, redacted or under seal as necessary to protect confidential business information. Petitioner shall regularly monitor the transmission service contracts for use of the transmission line. If at any time Petitioner's review of those contracts reveals that, within two years, contracts for use of the transmission line will fall below 50% of total line capacity, Petitioner shall notify the Board and parties and the Board will initiate a proceeding to investigate the appropriateness of establishing a decommissioning fund. Should the Board determine that a decommissioning fund must be established, Petitioner shall update the previously approved decommissioning plan and cost figures to fully fund the decommissioning fund, either through a letter of credit or other financial mechanism acceptable to the Board, on a schedule established by the Board during that proceeding. Failure to use the converter station, other than during planned or unplanned outages

or repairs, for a period of eighteen consecutive months, shall trigger Board review of whether the converter station should be decommissioned.

10. Petitioner shall not transfer its CPG without prior approval of the Board.

Compliance Filing Requirements Prior to Commencement of Construction

11. Prior to commencing construction of the Project, Petitioner shall file with the Board for review and approval the final versions of the Project design plans – exhibits TDI-JMB-4 (revised) and TDI-AW-2 (revised). The parties shall have 15 business days to file comments on the design plans with the Board.

12. Prior to commencing construction of the Project, Petitioner shall file with the Board and parties the final system impact study ("SIS") and I.3.9 approval, which shall be subject to review by the Board, the Department, VELCO, GMP, and BED. The Department, VELCO, GMP, and BED shall have 15 business days to file comments and recommendations in response to the System Impact Study and I.3.9 approval.

13. Prior to commencing construction of the Project, Petitioner shall file with the Board and parties a compliance filing demonstrating that all transmission and subtransmission upgrades that are required in Vermont due to the Project have obtained any necessary approvals pursuant to 30 V.S.A. § 248.

14. Prior to commencing construction of the Project, Petitioner shall file with the Board and parties all transmission service contracts with energy suppliers who will utilize the NECPL. The purpose of the filing shall be to confirm Petitioner's representations in its Petition that energy to be transmitted on the NECPL will be from hydro, wind, or other "renewable energy" sources, as defined under Vermont law. In addition, Petitioner will endeavor to obtain facility-specific information from its transmission customer(s) in order to track the source of energy shipped on the NECPL. Petitioner may submit redacted versions of such contracts to protect pricing and other business confidential and trade secret information.

15. Prior to commencing construction of the Project, Petitioner shall file with the Board all ANR permits that are required for construction of the Project and that had not been issued prior to the close of evidence in this proceeding. Submission of such permits shall be for notice

purposes only and shall not give rise to further review or proceedings by the Board, provided that such permit or permits do not require any material or substantial changes to the Project that have not yet undergone Board review.

16. Prior to commencing construction of the Project, Petitioner shall file a final blasting plan with the Board for review and approval. Parties shall have two weeks to file comments on the proposed blasting plan. Any subsequent material changes to the plan will require further Board review and approval.

17. Prior to commencing construction of the Project, Petitioner shall file a decommissioning plan with the Board for review and approval. The proposed decommissioning plan shall provide for the off-site removal of the converter station building and all structural steel components, and the restoration of the converter station site to a stabilized condition allowing for natural revegetation. Petitioner shall also provide a cost estimate for the decommissioning activities as part of the plan. Parties shall have 15 business days to file comments on the proposed decommissioning plan.

18. Prior to commencing construction of the Project, Petitioner shall file with the Board and the parties written confirmation that it has fulfilled all requisite CPG conditions under this section of the CPG and that it intends to commence construction of the Project.

Compliance Filing Requirements Prior to Commencement of Operations

19. Prior to commencing commercial operation of the Project, TDI-NE shall file with the Board for review and approval a noise monitoring plan to confirm that the Project complies with the sound level limits specified in Order paragraph 46, below. The plan shall be prepared and implemented under the direction of a qualified noise-control engineer and shall include a monitoring schedule to be implemented during the first year of operations under a variety of climatic and seasonal conditions, a complaint resolution procedure, and a process for addressing any exceedances of the sound level limits, should they occur. The Department shall have 15 business days to file comments and recommendations on the proposed plan.

20. Prior to commencing commercial operation of the Project, Petitioner shall file with the Board and parties a compliance filing demonstrating that all SIS mitigation measures or

supplemental subtransmission mitigation measures have been implemented at Petitioner's expense.

21. Prior to commencing commercial operation of the Project, Petitioner shall become a member of Dig Safe System, Inc., and for the life of the Project shall comply with the requirements of 30 V.S.A. Chapter 86 and PSB Rule 3.800.

22. Prior to commencing commercial operation of the Project, Petitioner shall file an underground damage prevention plan with the Department.

23. Prior to commencing commercial operation of the Project, TDI-NE shall file with the Board and parties written confirmation that it has fulfilled all requisite CPG conditions, and that it intends to commence commercial operation of the Project.

Conditions Pertaining to Economic Benefits and Public Good

24. Pursuant to the DPS/ANR/DHP Stipulation, the VELCO Agreement, and the prefiled direct and supplemental testimony of TDI-NE witnesses Donald Jessome, Eugene Martin, and Joshua Bagnato, Petitioner shall implement its public benefits plan with respect to payments to VELCO, Vermont renewable energy programs (through the Clean Energy Development Fund), the Lake Champlain Pollution Abatement and Restoration Fund, and the Lake Champlain Enhancement and Restoration Trust Fund.

25. Pursuant to Paragraph 17 of the VELCO Agreement, VELCO will establish a special class of stock, either directly or through a special purpose entity, in order to receive and distribute the quarterly payments to be made by Petitioner to Vermont's retail electric distribution utilities ("DUs") for the benefit of their ratepayers, contingent upon receipt of necessary approvals from the VELCO Board of Directors. The DUs shall be the owners of such stock, with their respective ownership in proportion to each DU's load ratio share in order to ensure an equitable distribution of benefits among Vermont ratepayers. VELCO shall distribute the TDI-NE quarterly payments, less any required taxes and administration costs, to the DUs as stock dividends on a quarterly basis, for the benefit of their ratepayers as required by the VELCO Agreement. In the event that the VELCO Board of Directors fails to issue the necessary approvals in accordance with the above, VELCO shall propose a new payment arrangement to implement Paragraph 1 of the

VELCO Agreement, subject to consent from TDI-NE, amendment of the Agreement, and approval by the Board.

26. Six months prior to the termination of the initial transmission service contracts for the Project, and subject to applicable FERC requirements, Petitioner shall negotiate in good faith with the DUs for up to 200 MW of transmission service on the NECPL for a term of up to 20 years. The price of such transmission service shall be determined at that time and shall be generally consistent with market prices; however, the price offered to the DUs shall not exceed the price of transmission service for a contract of similar size and scope executed in the prior three years.

27. If, at the conclusion of TDI-NE's open solicitation process for NECPL transmission capacity, NECPL's transmission capacity has not been fully allocated, then prior to the Project's commercial operation date, and subject to any applicable FERC requirements, TDI-NE and BED shall initiate good-faith negotiations for up to 30 MW of transmission service on the NECPL for a term of up to 20 years pursuant to the terms of the BED Stipulation.

28. No later than January 1st of the 37th year of commercial operation of the Project, Petitioner shall enter into discussions with ANR and the Department, and shall negotiate in good faith, regarding continued payment of public good benefits and/or other amendments to the DPS/ANR/DHP Stipulation in the event commercial operation of the Project extends beyond the 40th year. No later than January 1st of the 39th year of commercial operation of the Project, Petitioner shall file with the Board for review and approval a plan regarding the extension of benefit fund payments beyond the 40th year of commercial operations. In the event this plan does not reflect an agreement reached with ANR and the Department, Petitioner shall provide an explanation of the efforts it made to engage in good-faith negotiations, and the Board shall open a docket and establish a schedule to determine: (i) whether continued public good benefits are appropriate; and (ii) a plan for the continued payment of public good benefits if determined appropriate. Petitioner, ANR, and the Department shall automatically be parties to the docket. Petitioner shall be authorized to continue to operate the Project beyond the 40th year during and after the proceedings concerning the public good benefits, provided that if payment of public

good benefits ultimately is approved by the Board, the payment obligation shall be applied retroactively beginning in the 41st year of operation of the Project.

29. Pursuant to Paragraph 16 of the VELCO Agreement, to the extent that the Project has a regulated rate through the FERC Order 1000 process or another regional cost-sharing mechanism, Petitioner shall indemnify Vermont's regionally allocated share of the Project costs to ensure that the net benefit identified in Schedule I of the VELCO Agreement accrues to Vermont's retail electric customers by making additional payments to VELCO. VELCO or the special-purpose entity shall distribute these additional funds in accordance with Paragraphs 1 and 17 and other relevant provisions of the VELCO Agreement. In the event that the FERC Order 1000 process or another regional cost-sharing mechanism is utilized, and for so long as Project costs are being recovered by such process or mechanism, these additional indemnification payments shall not be suspended. Paragraphs 5 and 6 of the VELCO Agreement shall apply to these payments. Petitioner will not seek cost recovery for these additional indemnification payments whether under the ISO-NE Tariff or any other cost-sharing mechanism that allocates costs to Vermont ratepayers.

30. In the event that Paragraph 16 of the VELCO Agreement applies to the Project, the Department shall use its best efforts to minimize Vermont's regional share of the NECPL's costs.

Conditions Pertaining to Electric System Stability and Reliability

31. Petitioner shall be responsible for the costs of the transmission system and subtransmission system upgrades in Vermont that are necessary in order to address adverse impacts to system stability and reliability due to the Project, as determined by ISO-NE pursuant to the interconnection process administered by ISO-NE, and as determined pursuant to any supplemental subtransmission study performed pursuant to the GMP Stipulation.

32. Petitioner shall collaborate with GMP to design and implement in a timely fashion any mitigation strategies or system upgrades necessary or required to avoid adverse effects on the reliability and stability of the GMP electric system as a result of contingencies identified in the SIS or in a supplemental subtransmission study, if performed, as provided in Paragraph 5 of the GMP Stipulation.

33. In the event that a supplemental subtransmission study is prepared under Paragraph 5 of the GMP Stipulation, Petitioner shall file the final version of the study with the Board prior to the filing of GMP's section 248 petition(s) as set forth in Paragraph 5 of the GMP Stipulation.

34. The protections extended to GMP under Paragraph 5 of the GMP Stipulation shall also apply to VELCO and to all electric load-serving utilities in the state of Vermont.

35. Petitioner shall be obligated to pay for all costs reasonably incurred by GMP to implement the GMP Stipulation, including but not limited to the costs of the SIS mitigation measures, the supplemental mitigation measures, the SIS and SIS mitigation process, and the supplemental subtransmission study process provided for under Paragraph 5 of the GMP Stipulation. Petitioner shall reimburse GMP for any and all costs GMP reasonably incurs in implementing the GMP Stipulation, including the hourly costs of employees, consultants, and reasonable expenses.

36. Petitioner shall, in accordance with good utility practice, cooperate and coordinate with GMP and other affected Vermont electric distribution, transmission, and subtransmission system owners, if any, during pre-construction and construction to mitigate and minimize: (i) any adverse impacts on GMP's facilities, customers, employees, and contractors, including but not limited to outages, which shall only be taken as a matter of last resort; (ii) facility relocations; and (iii) impacts on GMP's ability to reliably and safely serve its customers.

37. Prior to construction of the Project, Petitioner shall undertake a process with GMP in which Petitioner and GMP will review on the ground and via detailed Project plans the entire overland portion of the Project where it coincides with GMP's facilities. During this process, all areas of potential adverse impacts on GMP's facilities, customers, and ability to reliably and safely serve those customers shall be identified and a mutually agreed-upon work plan shall be developed by the parties in accordance with good utility practice. The work plan shall identify how each identified impact will be mitigated or avoided. Such mitigation measures include but are not limited to minimizing to the fullest extent possible outages to GMP customers, ROW acquisition, facility relocations, and alternative construction procedures. All reasonably incurred costs of the process, work plan, and mitigation measures shall be paid for by Petitioner, including any reasonably incurred costs for GMP employees, consultants, contractors, and expenses.

38. Petitioner shall, in accordance with good utility practice, cooperate and coordinate with GMP and other affected Vermont electric distribution, transmission, and subtransmission system owners, if any, to ensure that operation of the Project does not cause adverse impacts on their distribution, transmission, and subtransmission systems; provided, however, that Petitioner shall at all times operate the Project in a manner that is consistent with ISO-NE's operating instructions. Petitioner shall follow good utility practice and Dig Safe provisions in the maintenance and operation of the Project. Prior to undertaking any maintenance of the Project, Petitioner shall determine whether GMP facilities or customers may be affected and shall provide reasonable advance notice of such maintenance. For any such maintenance, Petitioner shall work with GMP to develop a mutually agreed-upon maintenance plan subject to good utility practice to perform such maintenance in a manner that mitigates or avoids impacts on GMP's facilities, customers, or ability to safely and reliably serve such customers. Any and all reasonably incurred costs of such maintenance plan and mitigation measures shall be paid by Petitioner, including but not limited to reasonably incurred costs of GMP's employees, contractors, and consultants, plus expenses.

39. If, after construction of the Project, it is determined that there are adverse impacts on GMP's facilities, customers, or ability to safely and reliably serve its customers that are attributable to the Project and that could not have been reasonably foreseen prior to construction, Petitioner and GMP shall work collaboratively and subject to good utility practice to mitigate such impacts at Petitioner's sole expense.

Conditions Related to the VELCO PV20 Installation

40. Petitioner and VELCO, and other utilities if applicable, shall consult and coordinate regarding those aspects of the Project and those aspects of the existing PV20 installation and the PV20 project brought about by the need to accommodate the crossing of the cables (the "Works") and shall create a working group for this purpose. Such group shall meet on a regular basis and shall consist of appropriate engineering and project management personnel empowered to make decisions pertaining to the Works on behalf of Petitioner and VELCO, and other utilities if applicable.

41. Petitioner shall construct, maintain, repair, and operate the Project in accordance with good utility practice and avoid causing construction delays or other adverse impacts on the PV20 project.

42. Petitioner shall construct the Project in a manner that allows the safe and efficient removal of the existing PV20 installation and its replacement in its entirety, by employing for this purpose an underwater bridge or bridges or an alternative design that VELCO, and other utilities if applicable, agrees will provide a similar level of protection, at Petitioner's cost.

43. Petitioner shall reimburse VELCO or its designee for all reasonable costs that it or its designee incurs in connection with VELCO's obligations set forth in Condition 40, above, including, without limitation, its review of Petitioner's Project plans.

44. Petitioner and VELCO will cooperate to minimize costs related to construction, maintenance, and/or repair of the Works. Petitioner will reimburse VELCO, and its designee if applicable, for all reasonable costs attributable to Petitioner's actions or inactions that are incurred by VELCO, or its designee, in connection with the removal of the existing PV20 installation and the construction, maintenance, and repair of the proposed PV20 project; provided, however, that in the event that the need to perform repair, removal, or maintenance activities regarding the new PV20 installation is caused by the alleged negligence or other legally culpable act or omission of a third party, Petitioner shall not be required to make the reimbursements required above if VELCO has been indemnified pursuant to contracts of insurance or other risk-sharing arrangements, which arrangements VELCO shall make commercially reasonable efforts to secure prior to commencement of the PV20 project. Upon occurrence of such negligence or other legally culpable act or omission of a third party, VELCO will advise Petitioner of such occurrence in a timely fashion and will pursue the claim of indemnity in due course, consulting with Petitioner as appropriate.

45. Petitioner shall indemnify and hold harmless VELCO, and any other project owner, for any physical damage that the Project causes to the existing and proposed PV20 installations, and will hold harmless and indemnify and, at VELCO's option, defend VELCO against any third-party claims of any nature whatsoever arising out of the Project. VELCO will hold harmless and indemnify and, at Petitioner's option, defend Petitioner against any third-party

claims of any nature whatsoever arising out of the existing or proposed PV20 installation.

Conditions Pertaining to Aesthetics (Visual and Noise)

46. Sound levels due to operation of the converter station shall be measured at the exterior of the nearest residence and shall not exceed 45 dBA Leq (1-hour) (day or night). Petitioner shall implement the sound monitoring plan required as a pre-operation compliance filing under Condition 19, above. If sound levels exceed 45 dBA Leq (1-hour)(day or night), Petitioner shall install mitigation measures to ensure compliance with the limit.

47. Petitioner shall minimize tree removal along the entire route to the greatest extent practicable.

48. Petitioner shall take reasonable precautions during construction to limit impacts on nearby trees and shrubs on private property. If trees or shrubs on private property are damaged due to construction, Petitioner shall be responsible for replacements for a three-year period after construction.

49. At Shunpike Road in Shrewsbury, Petitioner shall coordinate the tree-planting plan with the property owner immediately adjacent to the Project, to the extent such owner agrees to become involved, as well as with the local planning commission and/or conservation commission. If neither the landowner nor the local planning commission or conservation commission elects to become involved in the tree-planting plan for this location, Petitioner shall confer with the aesthetics consultant for the Department to reach agreement on an appropriate aesthetic landscape mitigation plan for this location.

50. The converter station building shall be dark brown or dark gray in color. Other ancillary structures at the converter station site that are fabricated from galvanized steel similar to the equipment and structures at the Coolidge substation are not required to be painted.

51. Petitioner shall conduct a post-construction site visit in conjunction with the Department to determine if additional mitigation in the form of vegetative screening is necessary at the converter station.

Procedures for Post Certification Filings

52. All requests for an extension of time to review any post-certification filing shall be submitted to the Board within ten business days of the date the filing was made.

Dated at Montpelier, Vermont, this 5th day of January, 2016.

s/James Volz)
) PUBLIC SERVICE
)
s/Margaret Cheney) BOARD
)
) OF VERMONT
s/Sarah Hofmann)

OFFICE OF THE CLERK

FILED: January 5, 2016

ATTEST: s/Judith C. Whitney
Acting Clerk of the Board

Notice to Readers: This decision is subject to revision of technical errors. Readers are requested to notify the Clerk of the Board (by e-mail, telephone, or in writing) of any apparent errors, in order that any necessary corrections may be made. (E-mail address: psb.clerk@vermont.gov)

Appeal of this decision to the Supreme Court of Vermont must be filed with the Clerk of the Board within thirty days. Appeal will not stay the effect of this Order, absent further order by this Board or appropriate action by the Supreme Court of Vermont. Motions for reconsideration or stay, if any, must be filed with the Clerk of the Board within ten days of the date of this decision and Order.

Appendix A: Appearances

Andrew N. Raubvogel, Esq.
Geoffrey H. Hand, Esq.
Brian S. Dunkiel, Esq.
Victoria M. Westgate, Esq.
Dunkiel Saunders Elliott Raubvogel & Hand
for Champlain VT, LLC, d/b/a TDI New England

Sheila Grace, Esq.
Jeanne Elias, Esq.
for the Vermont Department of Public Service

Donald J. Einhorn, Esq.
Elizabeth B. McDonald, Esq.
for the Vermont Agency of Natural Resources

Toni H. Clithero, Assistant Attorney General
for the Vermont Agency of Transportation

John W. Kessler, General Counsel
Dale E. Azaria, General Counsel
for the Vermont Division for Historic Preservation

Herbert A. Durfee, III, Town Manager
for the Town of Fair Haven Selectboard/Planning Commission

Sandi Switzer, Town Administrator
for the Town of Wallingford Selectboard

Sandra Levine Esq.
for the Conservation Law Foundation

Adam Lougee, Executive Director
for the Addison County Regional Planning Commission

Kevin E. Brown, Esq.
Langrock, Sperry & Wool
for the Town of Rutland

S. Mark Sciarrotta, Esq.
for Vermont Electric Power Company, Inc. and Vermont Transco LLC

Appendix A: Appearances (Page 2)

Taylor Newton, Regional Planner
for the Northwest Regional Planning Commission

Thomas Kennedy, Executive Director
for the Southern Windsor County Regional Planning Commission

Charlie Baker, Executive Director
for the Chittenden County Regional Planning Commission

Richard H. Saudek, Esq.
Diamond & Robinson, P.C.
for the Town of Benson

Sharon Combes-Farr, *pro se*
Bruce Farr

William Combes, *pro se*
Ruth Combes

William F. Ellis Esq.
McNeil, Leddy & Sheahan, P.C.
for the City of Burlington Electric Department

Carolyn Browne Anderson Esq.
for Green Mountain Power Corporation