STATE OF VERMONT
PUBLIC SERVICE BOARD

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

PREFILED DIRECT TESTIMONY OF SEAN MURPHY

ON BEHALF OF CHAMPLAIN VT, LLC

December 8, 2014

Summary:

Mr. Murphy provides testimony concerning the Lake portion of the Project's potential impact on: the Natural Environment, Necessary Wildlife Habitat and Endangered Species, Development Affecting Public Investments, Public Health and Safety, and Transportation Systems, pursuant to 30 V.S.A. § 248(b)(5) .

Exhibit Number	Name of Exhibit
TDI-SM-1	Resume
TDI-SM-2	Aquatic Invasive Species Plan (TRC)
TDI-SM-3	Lake Acoustic/Sediment Survey (Manley)
TDI-SM-4	Lake Champlain Freshwater Mussel Survey Report (HDR)
TDI-SM-5	Lake Champlain Climate Change Report (TNC 2010)

Table of Contents

General Background

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

A1. Response: My name is Sean Murphy and I am the Office Practice Leader for Planning, Permitting and Licensing for the Augusta, Maine office of TRC Environmental Corporation ("TRC") located at 14 Gabriel Drive, Augusta, Maine.

Q2. Please describe your education and employment background.

A2. Response: I earned a Masters of Environmental Management from the Yale School of Forestry and Environmental Management in 1994. My focus during that time was on integrated watershed management, with significant coursework in hydrology, soils, and land use planning. In 2003, I was awarded a doctorate in Forest Management from the University of Maine. The focus of my dissertation was the development of decision tools to facilitate land use planning. During my tenure at the school I provided lectures for land use planning classes. In the last fifteen years, I have worked as a project manager and environmental scientist for a number of challenging environmental/ engineering projects. My principal experience includes directing multi-disciplined resource impact analyses, the preparation of technical environmental permit documents, and the development of practical mitigation proposals for projects involving complex environmental issues and permit conditions. I have been responsible for managing the publication of numerous environmental resource reports, impact analyses, and permit applications. My resume is attached as *Exhibit (Exh.) TDI-SM-1*.

Q3. Do you hold any professional licenses or certifications?

A3. Response: Yes, I am a Certified Environmental Professional (#14051416) by the Academy of Board Certified Environmental Professionals.

Q4. On whose behalf are you offering this testimony?

A4. Response: Champlain VT, LLC d/b/a TDI New England ("TDI-NE").

Q5. Have you previously testified before the Public Service Board or in other similar judicial or administrative proceedings?

A5. Response: Yes, I have previously provided written and oral testimony as part of the New York State Public Service Commission's Article VII review process for the Champlain Hudson Power Express Project, a 330+ mile high voltage direct current ("HVDC") electric transmission project that would connect generation from Canada to New York City, New York.

Q6. What is the purpose of your testimony?

A6. Response: My testimony focuses exclusively on the portions of the NECPL that will be installed within Lake Champlain. I provide an overview of the Project route and installation methods, and address natural resource impacts under 30 V.S.A. § 248(b)(5): air and water purity and water pollution, waste disposal, water supply issues, necessary wildlife habitat and endangered species, and development affecting public investments. Finally, I testify regarding public health and safety and transportation systems. Other lake-related impacts are addressed in the prefiled testimony of Dr. William Bailey and Mr. Andrew Thurman, which I reference as appropriate below.

Q7. Please describe your role in this Project.

A7. Response: In the fall of 2013, I was asked by TDI-NE to direct regulatory efforts related to the installation of the Project within Lake Champlain as well as all federal permitting. I was selected for this role based on my previous experience assisting with the development and permitting of a similar project in New York, the Champlain Hudson Power Express ("CHPE") Project. In this capacity I have participated in consultation with state and federal agencies, provided strategic guidance on a variety of development issues, and coordinated work done by other experts evaluating environmental impacts on the Project, including those related to water quality modeling, thermal and magnetic impacts, and Rare, Threatened, and Endangered ("RTE") species surveys. I also supervised work related to applications submitted to the U.S. Department of Energy and the U.S. Army Corps of Engineers.

Q8. Have you relied on the work of any other experts concerning this Project?

A8. Response: Yes. Drs. Tom and Patricia Manley of Marine Resources Inc. completed a similarity assessment of soils along the Project route relative to those along the route analyzed for the CHPE Project. HDR Engineering, Inc. ("HDR") completed water quality modeling of the impacts associated with the installation of the transmission system as well as a rare mussel survey. Exponent Inc. ("Exponent") modeled thermal and magnetic fields associated with the operation of the cables, as well as completed an assessment of the potential impacts of these aquatic species. Vanasse Hangen Brustlin, Inc. ("VHB") reviewed public water supply systems along the Project route and consulted with the Grand Isle Consolidated Water District as well as the Vermont Fish

and Wildlife Department related to the Grand Isle Consolidated Water District's Deep Intake, which I will discuss later in my testimony.

Q9. Have you provided Project information to other experts in support of their section 248 testimony and if so, what?

A9. Response: Yes, I have provided information to the Project team as to how certain environmental resource assessments and concerns were addressed during the development of the CHPE Project. I also provided information on the expected conditions along the routing which supported the prefiled testimony and exhibits provided by Dr. Bailey.

Selection of Lake Route:

Q10. Can you begin by briefly describing where the proposed Project will be installed in the Lake?

A10. Response: After crossing the U.S./Canadian border and being installed for approximately 0.5 miles underground within the Town of Alburgh, Vermont, the HVDC transmission line will enter Lake Champlain via horizontal directional drilling ("HDD"), as described in the Jessome/Martin/Bagnato prefiled testimony. The two cables will be bundled together and installed beneath (or, in deeper waters, be laid on) the bed of Lake Champlain lake bed for approximately 97.6 miles entirely within the jurisdictional waters of the State of Vermont before exiting the lake in the Town of Benson, Vermont via HDD. The overall route, as well as mileposts ("MP"), is depicted on the Project Plans - Lake Route (*see Exh. TDI-JMB-4*).

While the entry and exit points to the lake will remain fixed, the routing in the lake as shown in ***Exh. TDI-JMB-4*** is a preliminary layout at this time, and may be adjusted in places following more detailed engineering work necessary for the final construction-level plans. Construction level engineering will not be initiated until after all state and federal approvals have been received, so that any final site specific analysis completed will ensure compliance with the regulatory requirements that come with those authorizations. TDI-NE also has not as of this point selected an Engineering, Procurement, and Construction ("EPC") contractor, whose expertise may also further enhance the design of the Project so as to better ensure its reliability. This routing is offered for the purposes of understanding the potential impacts associated with the construction, operation and maintenance of the Project. However, TDI-NE is seeking the flexibility to adjust this route during final design with the understanding that any changes in routing would have the same or less impacts than the current route proposed.

Q11. Please describe the Route selection process and the primary factors that influenced selection of the route.

A11. Response: The initial in-water routing development focused on a number of key considerations. First, the routing needed to begin near the U.S. – Canadian border and be routed entirely within the State of Vermont. Second, water depths needed to be greater than 20 feet to the extent practical to allow for the typical draft of installation vessels. Third, areas with known geological obstacles, such as bedrock outcrops, were to be avoided to the extent feasible. Finally, the entry and exit points were identified based on a number of logistical factors, including availability of property, access to existing overland rights-of-way and avoidance of impacts to sensitive species and habitats.

From the outset of the route siting process, TDI-NE looked to avoid significant habitat and cultural features. The cables enter the water within the Main Lake adjacent to the New York border rather than the Restricted Arm to avoid any potential impacts to the Missisquoi National Wildlife Refuge. TDI-NE also presented the in-water routing to federal and state agencies as well as non-governmental organizations to help identify any early concerns. As a result of consultations with fisheries biologists at the Vermont Department of Fish and Wildlife, the cables were re-routed in the Main Lake to avoid identified rocky reefs and shoals where the water depth ranged from 10 to 40 feet, in order to reduce potential impacts on these fishery areas. The entire route was reviewed by Chris Sabick of the Lake Champlain Maritime Museum to identify known and potential cultural resources and the route was modified based on these findings (as discussed further in the prefiled testimony provided by Mr. Sabick). TDI-NE also elected to exit the lake in the Town of Benson rather that the Town of West Haven to avoid the potential in-water impacts associated with the deeper burial that would be required within the Narrows of the Lake Champlain Federal Navigation Channel as well as the anticipated impacts associated with clearing an HDD construction area in West Haven.

Installation Methods:

Q12. Let's turn to how the Project will be physically installed in the Lake. Can you briefly describe the different installation methods anticipated for this portion of the Project?

A12. Response: The cables will enter and exit the lake via an HDD installation as described in overview prefiled testimony provided by Jessome/Martin/Bagnato. With respect to installation in the lake, there are four types of installation which will be employed.

From MP 1 to 2, it is anticipated that the transmission cables will be installed by a divers lay, 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 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 the shear plow installation will occur until MP 98. Each of these installation techniques is described in prefiled testimony provided by Jessome/Martin/Bagnato and shown in the construction typicals of ***Exh. TDI-JMB-5***.

Q13. Please describe the anticipated burial depths associated with each installation method.

A13. Response: For the divers lay, jet plow, and shear plow installation methods, the transmission cables will be buried approximately 3-4 feet deep in the lake bed. In places where the lake is greater than 150 feet deep, the transmission cables will be laid directly on the bottom of the lake, and are expected to self-bury an average of approximately 1 foot into the sediment (except where laid directly on bedrock, which is expected to be less than 4% percent of length that is laid on the lake bottom or 2% of the entire route). During the final design process mentioned previously, 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. In some locations where the Project crosses other existing infrastructure in the lake, specialized installation methods, such as concrete mats, may be used.

Q14. What, if any, specific measures will be used to limit the Project's potential impact on the natural environment during the transition of the cables from the terrestrial segment to the lake?

A14. Response: The primary mitigation measure for this phase of installation will be the use of HDDs for the water-to-land transitions of the transmission line, which will avoid impacts to shorelines and nearshore habitats. To minimize turbidity associated with the HDD operation, TDI-NE proposes to have the HDD boring enter into a receiver casing, which is driven into the lake bottom at sufficient depth to contain drilled mud. In lieu of the receiver casing, a temporary cofferdam could be constructed at the offshore exit-hole location. A cofferdam would be approximately 16 feet by 30 feet with a dredged entry/exit pit typically 6 to 8 feet deep and constructed 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 the cables. Accepted industry practices for spill prevention and control, as discussed below, will be implemented during the in-lake HDD activities.

Q15. What specific measures will be used to limit the Project's potential impact on the natural environment during installation in the lake?

A15. Response: A series of complementary measures will be used to limit the Project's potential impact on the natural environment during installation. These generally include seasonal construction windows, monitoring and spill prevention during installation, and spill prevention planning for hazardous materials.

With respect to installation periods, TDI-NE is proposing construction work windows to avoid impacts to fish species during the most sensitive portions of their life

cycle. These windows were initially developed in consultation with the New York State Department of Environmental Conservation and the New York State Department of Public Service as part of the Champlain Hudson Power Express Project. In the northern portion of the lake from Alburgh to Chimney Point, Vermont (MP 0.5 to 74), TDI-NE is proposing that in-water construction activities occur from May 1st through September 15th. South of Chimney Point to Benson, Vermont (MP 74 to 98), construction activities would occur from September 15th through December 31st. TDI-NE is open to reasonable modifications of these timeframes so long as there is no need to have two construction seasons.

During installation, a qualified Environmental Inspector will be on-board the installation vessel and responsible for monitoring compliance with all applicable permit and approval requirements. Total Suspended Solids ("TSS") levels associated with the shear plow and jet plow installation will be monitored in real time at two route-perpendicular transects. The first transect will be conducted approximately 500 feet up-current of the operating jet plow/shear plow (or at reasonable safe survey distance up-current of the plow) to measure ambient or background TSS conditions. The down-current transect will be conducted 500 feet down-current of the installation device. If elevated levels of TSS are reported, the installer will employ such 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 suspension of in-situ sediments.

The installation of the aquatic portion of the transmission line would require the transport, handling, use, and onsite storage of hazardous materials and petroleum products, primarily associated with the operation of the vessels. To minimize potential

impacts from hazardous materials and wastes, TDI-NE would require all contractors to follow certain Applicant-proposed measures, which would include but not be limited to establishing a Spill Prevention, Control, and Countermeasure ("SPCC") Plan or its equivalent to prevent, control, and minimize impacts from a spill of hazardous materials, hazardous wastes, or petroleum products; keeping appropriate spill control equipment such as containment booms, water skimmers, and sorbents on site and ready for use; using secondary containment when practical; and following all appropriate Federal and State of Vermont regulations regarding management of hazardous materials and wastes.

In addition, TDI-NE has developed an Aquatic Invasive Species Management and Control Plan to describe the specific protocols to be taken during the construction, operation and maintenance of the Project to manage aquatic invasive species ("AIS") (***see Exh. TDI-SM-2***). The goal of this plan is to prevent the introduction and spread of invasive species potentially associated with Project-related operations and activities. To achieve this goal, the plan: a) identifies potential plant and animal AIS concerns in the Project area or within the broader vicinity (e.g., Lake Champlain); b) identifies potential pathways for AIS introduction in the Project area; and c) establishes measures to prevent and control AIS during Project construction, operation, and maintenance.

Operation and Maintenance:

Q16. Please describe the ongoing operation and maintenance of the Project with respect to the lake segments.

A16. Response: The cables proposed for this Project have an expected operational life of 40 years or more. They are solid (no fluids) with protective layers designed to provide superior mechanical and corrosion protection over their lifetime. As is the case with all

electrical transmission lines and devices, operation of the transmission line would produce electric and magnetic fields.

While the HVDC transmission cables would be designed to be relatively maintenance-free, the aquatic portion of the transmission system would be surveyed at least once every 5 years. These inspections would focus on verifying the depth of cable burial, condition of infrastructure protection measures, and identifying areas where protection of the transmission system or the environment could be compromised.

While not anticipated, it is possible that over the expected 40-year lifespan of the Project the transmission cables could be damaged, either by human activity or natural processes. If a cable were to be damaged, a protection system in place would detect the fault and the HVDC Converter Station switching system would de-energize the transmission system in approximately 5 milliseconds. An Emergency Repair and Response Plan ("ERRP") will be developed prior to the operation of the Project that identifies the appropriate vessels, personnel qualifications, and the construction methodology so as to minimize the response time. Once the failure location is identified, 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 reburied using a remotely operated vehicle ("ROV") jetting device.

Section 248 Criteria:

30 V.S.A. § 248(b)(5) -- Aquatic Natural Resource Assessment and Use of Natural Resources

Q17. Let's turn to your assessment of the Project's potential impacts on aquatic natural resources. Can you please briefly identify and summarize the types of potential impacts the Project may have on the aquatic environment.

A17. Response: Construction activities along aquatic portions of the Project route could result, on a temporary basis, in the disturbance and resuspension of sediments, increased water turbidity, and disturbances to aquatic species and habitat. These impacts are discussed in more detail in the prefiled testimony of Mr. Thuman and Dr. Bailey. Once the Project is operational, similar temporary impacts could reasonably be expected if repair activities are required for any portion of the transmission system, although these impacts would be limited to the immediate area where repair operations were being conducted. During the operational phase of the Project, impacts on the aquatic environment will be limited, and would primarily include localized impacts on shellfish, benthic communities and fish associated with the magnetic fields and increased temperature associated with the operation of the transmission line. These impacts are addressed in more detail the pre-filed testimony of Dr. William Bailey.

Q18. Let's first discuss potential impacts associated with the construction phase of the Project. What work that has been done to evaluate the Project's potential impacts on the aquatic natural environment during the construction phase?

A18. Response: A series of studies have been conducted to characterize lake conditions and assess the Project's potential impacts on natural resources in lake during construction.

In order to understand sediment conditions in the Project area, we worked with Drs. Tom and Patricia Manley, of Marine Resources, Inc. The Manleys conducted an analysis of acoustic sub-bottom profiles along the proposed Vermont route and used that analysis to compare conditions on the Vermont side of the lake with acoustic sub-bottom profiling and core sediment samples collected in the New York waters of the lake for the Champlain Hudson Power Express in 2010 and 2012. The methodology and results of the Manleys' analysis are discussed in more detail in their report, which is provided as ***Exh. TDI-SM-3***. As a result of this analysis, the Manleys were able to classify the majority of the Vermont route (99%) into one of three basic sediment types (recent Lake Champlain ("LC"), Champlain Sea ("CS") and Lake Vermont ("LV"), which provided sufficient sediment property information for the water quality modeling completed by HDR.

Based on this sediment analysis, TDI-NE worked with HDR to analyze the Project's potential impact on water quality during installation. This analysis consisted of detailed water quality modeling to estimate the potential dispersion of sediment and other constituents during the cable installation process for the Project for each installation type (jet plow and shear plow). For the deeper waters (anything below 150 feet), the water quality model assumed installation via a jet plow in order to present a conservative scenario for water quality impacts, but it should be noted that the present plan for those deep water areas is to simply lay the cables on the bottom and allow for self-burial. This modeling effort and its results are described in the prefiled testimony of Mr. Andrew Thurman, but I will note that the results indicate that Project-related activities will be in compliance with relevant criteria in the Vermont Water Quality Standards ("VWQS").

TDI-NE also evaluated potential impacts on rare threatened and endangered species in Lake Champlain. As described in the prefiled testimony of Mr. Galen Guerrero-Murphy, consultation was conducted with the Vermont Agency of Natural Resources ("ANR") earlier this year. Based on the recommendation of Mark Ferguson of the Vermont Fish and Wildlife Department ("VT FWD"), surveys for sensitive mussel species were completed by HDR 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. The full results are included in a report entitled *New England Clean Power Link, Lake Champlain Freshwater Mussel Survey Report*, which is provided as ***Exh. TDI-SM-4***. Based on these results, the VT FWD 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.

Q19. Let's move to the maintenance phase of the Project. What work has been done to evaluate the Project's potential impacts on the aquatic natural environment related to maintenance activities?

A19. Response: The proposed cable installation design and techniques identified by TDI-NE will minimize the potential for mechanical damage to the cable system and ensure operational safety and reliability of the cables, but as discussed above it is possible that over the 40-year lifespan of the NECPL Project the transmission cables may require repair. In the event of aquatic cable repair, the location of the problem will be identified

and crews of qualified repair personnel will be dispatched to the work location to remove the damaged segment of cable and replace it. The anticipated impacts for this maintenance work are consistent with those temporary impacts associated with installation, but at a much smaller scale, as maintenance work will be limited geographically to any impacted segments of the cable.

Q20. Now with respect to operations of the Project, what work has been done to evaluate the Project's potential impacts on the aquatic natural environment during the operational phase?

A20. Response: The primary operational impacts are the magnetic and thermal fields associated with the operation of the transmission system. Prefiled testimony submitted by Dr. William Bailey of Exponent describes the modeling efforts that were completed in order to quantify these impacts. His testimony indicates that, based on the calculated values for these two parameters, ambient conditions, and an assessment of likely biological responses, the operation of the transmission line would not be expected to have an undue adverse impact to aquatic resources over the lifespan of the Project.

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

Q21. In your opinion will the Project have an undue adverse impact on water quality in Lake Champlain?

A21. Response: No. This opinion is supported by the analysis described in more detail in Mr. Thuman and Dr. Bailey's prefiled testimony, which each address aspects of this issue in more detail. In addition to the issues addressed by Mr. Thuman and Dr. Bailey, TDI-NE has taken appropriate steps to limit the Project's potential water quality impacts.

These measures include but are not limited to the HDD installation in near shore environments, the use of an environmental inspector during installation activities, and proper waste disposal methods as is described later in my testimony.

Perhaps the most significant measure adopted by TDI-NE is its selection of low-impact installation technologies along the lake route. As shown in the water quality modeling results provided by Mr. Thuman, the use of the jet plow installation method in the shallower portions of the Main Lake results in only temporary impacts to water quality, with background conditions being restored in a short period. In deeper waters, where there is a low risk of interacting with maritime users, the cables would be laid on the bottom to allow for self-burial.

In the southern portion of the route, south of Chimney Point, TDI-NE is proposing to use the shear plow installation method. This plow is towed so as to essentially carve the lakebed, thereby reducing the expected sediment suspension with a narrower trench than is created with the jet plow. This method requires certain sediment and water level conditions to be present, as compared to the jet plow which can be done in most environments. The use of the shear plow installation method will also help minimize disturbance of any areas in southern Lake Champlain where historic anthropogenic activities may have affected the quality of lake sediments.

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

Q22. Please describe what, if any, potential sources of air pollution are associated with the installation or operation of the Project in the lake segment.

A22. Response: The sources of air pollution associated with the construction of the aquatic portion of the transmission system would primarily be diesel fuel-powered internal

combustion engines. Heavy equipment, barges, generators, and vessels would emit pollutants such as carbon monoxide ("CO"), carbon dioxide ("CO2), sulfur oxide ("SOx"), particulate matter ("PM"), nitrogen oxide ("NOx"), and volatile organic compounds ("VOCs"). During operation of the Project, the only impacts on air quality would be emissions from maintenance-related equipment.

Q23. In your opinion, will the installation or operation of the Project in Lake Champlain Project have an undue adverse effect on air quality?

A23. Response: No. All emissions associated with aquatic cable installation would occur during an approximately 1-year construction season, although actual installation would only occur during approximately 1/3 of a year. Emissions associated with construction of the aquatic portions of the Project are expected to be de minimis in terms of pollutants. Should it be determined that any of the equipment utilized for installation of the cables require permits for associated air emissions, permits will be obtained from the appropriate regulators. Similarly, the anticipated levels of emissions related to maintenance activities are also below these thresholds. No direct emissions would occur from the operation of the Project and, as discussed in the prefiled testimony of Mr. Seth Parker there would be an overall reduction in Green House Gases due to this clean energy replacing fossil-based sources.

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

Q24. Please describe how waste disposal will be addressed for the lake portion of the Project during construction.

A24. Response: Consideration of wastewater disposal under the Act 250 Waste Disposal criterion involves both sanitary wastewater and the potential release of hazardous materials. With respect to sanitary wastewater, during the construction of the in-water portion of the Project, waste material generated on vessels will be stored in holding tanks until they can be disposed of at a sanitary waste pump-out facility. Once the Project is operational, no sanitary facilities will be required.

To minimize potential impacts from petroleum products or hazardous materials and wastes, TDI-NE will enact certain measures to prevent, control, and minimize these types of spills. All contractors will be required to follow the protocols of an Applicant-developed SPCC Plan or its equivalent and to have appropriate spill control equipment on board and ready to use.

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.

Q25. Will the construction and operation of the Project in Lake Champlain meet all applicable state regulations with respect to waste disposal?

A25. Response: Yes. For the reasons stated above, the Project will meet applicable health and environmental conservation department regulations regarding the disposal of waste, and does not involve the injection of waste materials into groundwater or wells.

10 V.S.A. § 6086(a)(2) & (3) Water Supply & Impact on Existing Water Supplies

Q26. Please describe the water needs of the Project during construction.

A26. Response: During construction, water use will be limited to potable water for construction staff and operation of the jet plow. Water use by construction personnel will be de minimis. The jet plow is equipped with hydraulic pressure nozzles that create a downward and backward flow of water within the trench, fluidizing the sediment. The use of water for the jet plow would merely involve re-circulating water within the Lake in a non-consumptive manner. There is no direct water use associated with the operation of the Project.

Q27. Will the Project have adequate water supplies to meet its needs?

A27. Response: Yes, as a relatively low volume of water will be needed for the construction personnel and sufficient water is available within Lake Champlain to be recirculated through the hydraulic jet needed for underwater construction of the Project. Once operational, there will be no ongoing water use associated with the Project.

Q28. Turning to the potential impact on existing water supplies, can you please describe the Project's potential impact on water supplies in Lake Champlain?

A28. Response: Lake Champlain is used as a source of water for various public water systems as well as for private users. Research conducted by VHB (see ***Exh. TDI-JAN-11a***) indicates that 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. Mapping of these locations is provided in ***Exh. TDI-JAN-11b***. The Project will also pass in the vicinity of some private intakes, such as summer camps that obtain water from the Lake.

As discussed earlier in my testimony, HDR has modeled sediment suspension, transport, and water quality effects that could be caused by the jet-plow and shear-plow that would be used to install the underwater cable, to determine the degree and extent of elevated suspended solids. Results of that work indicate that significantly-elevated levels of lake sediment in any given area would be very short lived and would not extend more than 200 feet from either side of the cable system. Similarly, the concentrations of potential sediment-related pollutants including metals (As, Cd, Cu, Pb, Ni, Zn, and Ag) and mercury would be compliant with the VWQS at all times. With one potential exception, discussed further below, most of the public water intakes are at least 800 feet from the Project work area, and thus would not entrain sediment or turbidity from Project construction.

Regarding private water intakes, such as those supplying summer camps, these water sources are typically located close to shore whereas the NECPL route is generally in the deeper waters of the Lake. As such, the intakes for these small sources would

generally be outside the area of temporarily-suspended sediment from Project construction. These systems also operate at low flow rates, further reducing the potential that they would entrain sediment or turbidity from Project construction. VHB also contacted the Vermont Department of Environmental Conservation ("VT DEC") and the Vermont Department of Health ("VT DOH") on behalf of TDI-NE, and neither agency was aware of any private water intakes along the Project route. The VT DEC has noted that lake intakes are not an approved source of potable water for private systems in accordance with current regulations (VT Environmental Protection Rules, Chapter 1: Wastewater System and Potable Water Supply Rules).

Q29. What measures will be taken to limit the Project's potential impact on existing water supplies in Lake Champlain?

A29. Response: Placement of the cable is being designed to avoid conflicts with existing underwater infrastructure such as water system intakes and pipes, to the extent practical. The locations of all Vermont public water system lake intakes have been mapped and are avoided by the Project with the one exception discussed below. Pre-construction reconnaissance, including a side scan sonar analysis and bottom sampling of the lake, in addition to observation during installation, will also be performed to ensure that the cable is placed where it does not interfere with existing public or private intakes and other infrastructure to the extent practical. In addition, TDI-NE will notify all public water systems shown on ***Exh. TDI-JAN-11b,*** as well as others identified by the VT DEC and the VT DOH, at least three weeks prior to construction. Notification will be in writing and will include detailed information on the Project schedule, methods, the predicted effects (if any) to sediment and turbidity, and contact information.

The only public water intake located in close proximity to the cable route is one of the two intakes supplying the Grand Isle Consolidated Water District. This water system's "deep intake" is located approximately 100 feet to the west of the current cable routing and may experience elevated levels of turbidity or suspended sediment for a few hours when the cable is installed. The "shallow intake" is approximately 2,000 feet to the east of the current route. VHB contacted the operator of the Grand Isle Consolidated Water District ("District") to discuss this issue on behalf of TDI-NE, and was told that the District could operate exclusively using the shallow intake during installation.

During this consultation, it was noted that the District shared the intakes and pipes with the VT FWD, which utilizes the water to supply the Ed Weed Fish Culture Station ("Fish Hatchery") that is operated by the ANR. According to the Fish Hatchery's facility engineer and fish culture specialist, the facility pumps water from the deep intake almost continuously throughout the year. Increased turbidity would be a concern, so that placing the cables on the bottom (as is proposed in this segment of the routing) rather than trenching through the use of a jet plow would be preferable. Fish Hatchery staff also indicated that it may be acceptable for the NECPL cable to cross over the deep intake's pipe, which is a 36-inch diameter high-density polyethylene pipe that is anchored with concrete saddles that have settled into the lake-bottom sediment. TDI-NE will continue to coordinate with the owners of this water system regarding the exact location of the transmission cables, operational practices, and other actions that could be taken during construction to avoid issues with sediment affecting the water source.

Q30. In your opinion, will the Project have an undue adverse impact on the use of existing water supplies in Lake Champlain?

A30. Response: No. Based on the fact that Project construction activities will be planned to avoid conflicts with the locations of water intakes, will occur only for a short duration, and are not likely to mobilize significant amounts of sediment from the lake bottom in proximity to water intakes, it is not expected that the underwater portion of the Project will have any adverse effect on water sources.

10 V.S.A. § 6086(a)(8)(A) – Necessary Wildlife Habitat and Endangered Species

Q31. Looking now to necessary wildlife habitats and endangered species, in your opinion what rare, threatened and endangered plant and animal species are present along the Project's route in Lake Champlain?

A31. Response: Mr. Guerrero-Murphy's prefiled testimony includes a report dated November 2014 entitled *Survey Results Report: Rare, Threatened, and Endangered Species Necessary Wildlife Habitat, and Natural Community Survey Program* (***Exhs. TDI-GGM-2 and TDI-GGM-3***). It lists ten (10) aquatic RTE plant species Element Occurrences ("EO") and seventeen (17) aquatic RTE animal species EOs in the vicinity of the Project based on the Vermont Natural Heritage Inventory ("NHI") database. Based on consultation with the VT FWD, the only in-water survey determined to be necessary was related to rare mussel species in the northern section of the Project route and no live threatened or endangered mussel species were observed during that survey work. Based on desktop and field work, it is not anticipated that any of these species would be adversely impacted by the Project construction, operation, and maintenance.

Q32. How was the analysis of the potential impacts on rare, threatened or endangered species along the Project's lake route conducted, and what were the results?

A32. Response: As described in Mr. Guerreno-Murphy's prefiled testimony, a literature review of RTE species that had been located or could be located along the aquatic portion of the route was completed. 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 animals that occupy the nearshore waters would be avoided through the use of HDD installations.

In reviewing the report, the ANR's only recommendation for aquatic plant or animal species was that a survey for sensitive mussel species be conducted. The results of that survey, which was completed by HDR in cooperation with Biodrawversity LLC, found no native RTE mussels along the Project route. This study is provided as *Exh. TDI-SM-4*.

In terms of the operation of the transmission system, Dr. William Bailey's prefiled testimony describes his firm's review of how aquatic species might respond to the operation of the cables, specifically in reference to the thermal and magnetic fields. Various scenarios for thermal exposure were considered by Exponent. Their modeling indicated that the water temperature increases would remain below 1°F in the shallow waters where the cables will be trenched by jet plow or shear plow. In the deeper waters (>150 feet), the maximum temperatures at the lake bottom would be slightly above 1°F within a thin area of water that is 0.3 inches thick and 2.8 feet wide above the cables that self-bury. When laid on bedrock (which is expected for only 2% of the route), the area of water slightly above 1°F would be 2 inches thick above the cables and approximately 1-2 inches wide on either side of the cables. According to Dr. Bailey's analysis, these limited

increases in water temperature immediately adjacent to the cable are not expected to have any adverse effects on benthic aquatic species. These impacts are further described in Dr. Bailey's prefiled testimony and supporting analysis of thermal effects, contained in ***Exhs. TDI-WHB-2 and TDI-WHB-3***.

For magnetic fields, Dr. Bailey's prefiled testimony states that the effect of the Project on the ambient geomagnetic field will be limited to the area immediately surrounding the cables, and that the highest expected values are significantly lower than the public exposure limit recommended by the International Commission for Non-Ionizing Radiation Protection. While some species with specialized sensory receptors may detect the changes in the DC magnetic field and associated induced electric field in moving water, the area where these fields would be increased is minor in relation to the size of the lake. His prefiled testimony concludes that there would be no adverse impact on aquatic species, include Lake sturgeon (*Acipenser fulvescens*), from the operation of the transmission system. These effects are discussed further in Dr. Bailey's prefiled testimony and his supporting analysis of magnetic effects, contained in ***Exh. TDI-WHB-3.***

Q33. Based on the results of field work conducted for the Project, have you made any recommendations to TDI-NE in regard to any rare, threatened or endangered species?

A33. Response: No, as no further work or mitigation measures appear to be necessary at this time.

Q34. Turning to necessary wildlife habitat, can you please describe any studies that have been conducted on the potential impacts of the Project on necessary wildlife habitat along the Project's route in Lake Champlain?

A34. Response: Necessary wildlife habitat is defined as "concentrated habitat which is identifiable and is demonstrated to be decisive to the survival of wildlife at any point in its life, including breeding and migratory periods." In Vermont, this term has generally been applied to deer and moose wintering habitat, and certain types of bear habitat. To my knowledge, there are no previously-designated types of necessary wildlife habitat in Lake Champlain which intersect with the Project route, and none have been identified or discussed in consultations with state agencies. The Project as proposed would impact a narrow band of Lake Champlain and there is no information that suggests that the habitat occupied by the transmission system is of a higher quality than that on either side of the cables. As such, there does not appear to be any necessary wildlife habitat along the Project route.

At the federal level, the Magnuson-Stevens Fishery Conservation and Management Act requires the protection of "essential fish habitat" ("EFH"), which is defined as "those waters and substrate necessary to fish for spawning, breeding, feeding or growth to maturity". The National Oceanic and Atmospheric Administration's ("NOAA") Essential Fish Mapper site indicated that as of November 17, 2014 there is no designated EFH in Lake Champlain. The Endangered Species Act ("ESA") requires that any threatened or endangered species listing include a designation of critical habitat, which includes those areas occupied by a threatened or endangered species in which are found physical and biological features that are essential to the conservation of the ESA-listed species. There are no federally-listed aquatic species along the Project route.

Based on this information, no studies related to necessary wildlife habitat appear to be warranted.

Q35. Are there measures that have been taken in the Project's design to minimize impacts on wildlife species and habitat along the Project's route in Lake Champlain? Please describe.

A35. Response: Yes, as previously described, a number of measures have been taken to avoid and minimize impacts to wildlife species. These initiatives include routing and the use of HDD to avoid sensitive shoreline resources, construction work windows designed to avoid sensitive life cycle periods, and environmental monitoring during installation to maintain compliance with all applicable regulatory requirements as well as Applicant-developed mitigation methods.

Q36. In your opinion, will installation or operation of the Project destroy or significantly imperil necessary wildlife habitat or any endangered species?

A36. Response: No, for the reasons described above.

Q37. With respect to the criteria you have addressed, what is your opinion regarding the proposed Project's impact on the natural environment and the use of water resources in Lake Champlain.

A37. Response: The Project will result in non-significant localized impacts to the natural environment and water resources during installation. There will be increases in turbidity

associated with the cable installation, with water quality impacts that are within regulatory standards. There could be potential non-significant mortalities of non-mobile species, although no such RTE species have been identified. During operation, the impacts from any emergency repairs would be short-term and more localized than those associated with construction. The expected magnetic and thermal field levels associated with operation will be localized and are not anticipated to pose any adverse impacts on aquatic species. See *Exhs. TDI-WHB-2 and TDI-WHB-3*.

30 V.S.A. § 248(b)(5), 10 V.S.A. § 6086(a)(5) –

Public Health and Safety and Transportation Systems

Q38. What, if any, impacts will construction of the aquatic portion of the Project have on public health and safety or transportation systems?

A38. Response: Impacts on public health and safety or transportation systems during construction could occur due to the additional vessel traffic generated by site preparation for and installation of the transmission cables along the proposed route. For site preparation, in the year preceding transmission line installation, debris would be removed from the route (i.e., route clearing). This activity would require use of a tug and barge equipped with a grapnel system. Support vessels would include a crane barge to remove larger debris as required or a debris barge to transport recovered lakebed debris, as well as smaller vessels to transport crew to and from the operation. During installation via jet plow, shear plow or cable laying, TDI-NE would employ a fleet of approximately four vessels, including the tugboat or tow boat, cable-laying vessel, crew boat, and survey boat which would be used to coordinate the laying of cable. TDI-NE anticipates that crew

boats will likely make multiple daily trips from a nearby marina to transport personnel and supplies to the installation barge (estimating about 3-6 trips/daily).

During debris removal, the barge would proceed at a speed of 1.5 knots or less. In areas with significant side-scan and magnetometer targets, the speed would be reduced to less than 1 knot. The route transected for clearing would follow the path of the proposed transmission line. Transit speeds for these would generally be no faster than 8 to 12 knots depending on weather, currents, and barges in tow. During installation, the speed of the installation vessel would be comparable to the debris removal barge, and the support vessels would also generally be no faster than 8 to 12 knots.

Both pre-and post-construction, TDI-NE will be completing surveys of the route. Potential surveys include bathymetry, magnetometer, side scan sonar and core sampling. It is expected that the average speed of the survey vessels would be about 3 to 4 knots, with any support vessels traveling at around 8 to 10 knots while transiting.

A "chain-ferry" operates using cables laid perpendicular to the Project route. The ferry cables will be temporarily removed to facilitate the installation of the underwater cables. The ferry cables will then be replaced over the top of the transmission cables. The ferry operator reports that its cables are typically replaced every year in November; therefore, there may be an opportunity to coordinate the HVDC cable installation schedule with the ferry cable replacement schedule. Detailed coordination and discussions will be required with the ferry operator on methodologies and scheduling. Overall, impacts to lake users are expected to be temporary and insignificant. Transmission cable installation would not prohibit water-dependent recreational or commercial activities because vessels could either transit around the work site or use a different area of the waterway. If conditions do not allow other vessels to transit around

the work site, TDI-NE would ensure that aquatic construction does not interfere with routine navigation by making adjustments to the installation schedule as required. For example, installation of the transmission cables would be coordinated with the ferry operator to minimize impacts on ferry operations.

Q39. Please describe any design criteria which have been used to minimize public health and safety or transportation systems' impacts due to construction of the Project within the Lake Champlain segment.

A39. Response: TDI-NE or its agents will be responsible for developing an Aquatic Safety and Communications Plan for cable installation. The purpose of the plan is two-fold inasmuch as it will include information regarding the daily underwater cable operations protocols as well as protocols for coordinating with waterbody regulatory authorities. The final Aquatic Safety and Communications Plan will meet regulatory permit conditions, including OSHA 29 CFR 1926.106, as applicable.

Prior to and during cable installation, TDI-NEs or its agents will follow U.S. Coast Guard ("USCG") regulations for safely operating vessels and coordinate with USCG Waterways Management and Vessel Traffic Services. The following information will be provided to the Waterways Management Office:

a) Start and completion dates for the underwater cable route;

b) Cable installation work schedule;

c) The names of the work vessels;

d) The VHF radio channel(s) the vessels will be monitoring;

e) Twenty four (24) hour point of contact.

This same information will be provided to local waterway users through the USCG's "Local Notice to Mariners".

During nighttime construction activities, vessels would be outfitted with identification lights and working decks would be illuminated for safety. Lights would not be directed into surrounding waters, thereby reducing the potential for effects on benthic communities and fish.

All vessels associated with the construction project would operate at "no wake/idle" speeds (i.e., less than 4 knots) at all times while in the construction area and while in water depths where the draft of the vessel provides less than a 4-foot (1.2-meter) clearance from the bottom. In areas with substantial objects recorded in side-scan sonar and magnetometer surveys, the speed would be reduced to less than one knot. All vessels would preferentially follow deepwater routes whenever possible.

Q40. What, if any, impacts will operational/maintenance activities on the aquatic portion of the Project have on public health and safety or transportation systems?

A40. Response: The magnetic field produced by the cables during operation could impact the readings on mechanical navigational compass readings. As discussed in Dr. Bailey's prefiled testimony, for cables bundled and buried at 3 feet, the maximum deviance from magnetic north at 19 feet directly above lakebed would be an estimated 2.9 degrees from the 14.35° W geomagnetic declination (the difference from magnetic north relative to geographic north). Compass deflection falls off rapidly with distance from the cables, so that within 25 feet of the cables the deflection is almost zero. The expected deviation is greater when the cables are not buried, but this would only occur in those limited instances of a bedrock or utility crossing in shallow waters or when bedrock is crossed in

deeper waters (where the water depth will be sufficient so that there will be no impacts on the compass system). There will be no impacts on navigational systems that rely on GPS. Given that the cables are located away from the shoreline, this deviation is not expected to have a significant impact on navigation. Magnetic effects are discussed further in Dr. Bailey's prefiled testimony and his supporting magnetic analysis, *Exh. TDI-WHB-3.*

The other potential operational risk associated with the transmission system is the potential for anchor snags. As discussed in the overview prefiled testimony of Jessome/Martin/Bagnato, TDI-NE will be utilizing the two most common methods of protection for a submarine cable: cable armoring and burial. The Project cables for the in-water portion of the route will have a protective layer of galvanized steel wires, which are coated in bitumen to prevent corrosion. The armor layer protects against damage due to any motion of the cables on rocks as well as recreational impacts (e.g. small vessel anchors, fishing gear). In shallower waters, additional protection against physical damage will be provided by burial to a depth of three to four feet.

In locations in Lake Champlain where the water depth is 150 feet or greater (approximately MP 22 to 66), TDI-NE proposes to lay the cables on the lake bed. For a similar project, Arthur B. Cohen, Executive Director of the Lake Champlain Maritime Museum, advised TDI-NE that no commercial fishing operations remain on Lake Champlain and that vessels plying Lake Champlain are predominately privately-owned pleasure craft, which do not have anchors large enough to impact the cables. Mr. Cohen did note that a few commercial sight-seeing vessels and some waterfront maintenance or construction vessels also operate on the Lake. These vessels either restrict their operations to shallow water or, when in deep water, are cruising and not anchored. On

occasion, specialized craft do traverse the lake along defined corridors for limited periods of time to complete discrete, specific tasks, but these are limited. Mr. Cohen doubted that significant changes in the maritime use of Lake Champlain in the foreseeable future are likely. TDI-NE has also spoken with representatives from the commercial vessels that operate on the lake, including the Lake Champlain Transportation Co., Spirit of Ethan Allen III, Fort Ticonderoga II, Melosira and the David Folger. Although additional coordination is required with some of these vessels prior to construction, no significant concerns were raised by the operators. If required, prior to construction TDI-NE will complete a Navigation Risk Assessment to quantify (and mitigate for) the potential risk of external damage to the cables as well as potential impacts to navigational safety.

It may be necessary to deviate from target burial depths where there is a) existing infrastructure or b) geologic or bathymetric features that prevent burial at such depth. When obstructions prevent burial to the target depth, TDI-NE proposes to adhere to the industry standard of providing protective coverings. In these locations, the plow or water jetting device will be lifted off the bottom, moved forward past the obstacle and then re-deployed to the bottom once safely across. A protective cover such as articulated concrete mats will be installed over the cables. These types of mattresses have been shown to be an effective measure to reduce the risk to infrastructure by a dropped or dragged anchor. Many established concrete mattress products are shaped so as to deflect an anchor being dragged across the surface. In an instance of a penetrating drag, an individual mat section could serve as a sacrificial element, rather than the underlying cable.

In terms of maintenance activities, TDI-NE will perform regular inspections and possibly emergency repairs of the transmission line. Regular inspections of aquatic portions of the transmission line will be completed using vessel-mounted instruments. Emergency repair activities would be similar to those associated with the installation of the transmission system, although in a more localized area. For these activities, the impacts would be insignificant and temporary.

Q41. In your opinion, will the Project cause unreasonable congestion or unsafe conditions with respect to transportation systems within Lake Champlain?

A41. Response: No. The level of activity and associated vessel speeds for the construction and maintenance of the Project are consistent with existing vessel traffic on the lake, and, as noted above, will be conducted in accordance with U.S. Coast Guard regulations.

Q42. Will the Project have an undue adverse effect on public health and safety relative to the Lake Champlain segment?

A42. Response: Construction and maintenance of the Project would not have significant impacts to the existing aquatic-based transportation and traffic network, as the increased vessel traffic associated with these activities would occur intermittently for short durations within the proposed construction corridor. The anticipated compass deviation associated with the cables would impact only a limited area for a short span and only in shallow waters. TDI-NE has taken appropriate measures to protect maritime users from impacts associated with anchor snag or drop.

10 V.S.A. § 6086(a)(9)(K)) – Development Affecting Public Investments

Q43. In your opinion, will the Project unnecessarily or unreasonably endanger the public or quasi-public investment in Lake Champlain?

A43. Response: No. As described in testimony above, and in the prefiled testimony of Dr. Bailey, Mr. Thurman, and Mr. Sabick, construction activities along aquatic portions of the Project route could result in temporary increases in water turbidity, disturbance and resuspension of sediments, disturbances to aquatic species, increased vessel traffic, and increased air emissions. Maintenance and repair operations could have similar types of impacts, but these would be localized. Generally, any temporarily disturbed areas would recover after construction and maintenance vessels leave the area and adverse impacts would be minimized by Applicant-proposed measures. In addition, the routing has been designed to avoid and/or minimize impacts on cultural resources located within the lake.

Long-term impacts associated with the operation of the Project would include the presence of concrete mattresses in discrete locations, minor, localized increases in water temperature and the generation of limited magnetic fields. As described above, concrete mattresses are an industry standard for the protection of utilities when burial is not an option. The prefiled testimony of Dr. Bailey demonstrates that the impacts associated with the thermal and magnetic levels will be insignificant.

Q44. Will installation or operation of the Project materially jeopardize or interfere with the function, efficiency or safety of Lake Champlain?

A44. Response: No. As described above and in the prefiled testimony of Dr. Bailey and Mr. Thurman, water quality impacts associated with the installation and repair of the transmission system are expected to be insignificant and of short duration. TDI-NE has

adopted certain mitigation measures, including an Invasive Species Management Plan, to avoid and/or minimize other impacts that could be associated with these activities. During operation of the Project, the thermal levels associated with the operation of the Project will be localized to the immediate area around the cables. Similarly, the increased magnetic field will be detectable only in close proximity to the cable system and is not anticipated to have significant impacts on aquatic species or navigation.

In terms of safety, TDI-NE has adopted mitigation strategies to avoid interactions between the cable system and maritime users. In waters of less than 150 feet of depth, the cables will be buried to a depth of three to four feet or, where these burial depths cannot be achieved, protected with concrete mattresses. In deeper waters, TDI-NE will lay the cable on the bottom and allow for self-burial as the few large vessels utilizing the lake either restrict their operations to shallow water or, when in deep water, are cruising and not anchored.

Q45. What about public use of Lake Champlain—will the Project's installation or operation materially jeopardize public use, enjoyment, or access to Lake Champlain?

A45. Response: No. As discussed above, construction and maintenance activities will pose only temporary and localized inconvenience to vessels on the lake, in the specific areas in which the cable installation is occurring. Once the cables are operational, there will be no long-term changes to how the public currently uses, enjoys or accesses the lake.

Q46. Are there measures that will be taken by TDI-NE to protect public investments and use of Lake Champlain?

A46. Response: Yes. In addition to the numerous mitigation measures discussed above, TDI-NE is also proposing to establish a Lake Champlain Phosphorous Cleanup and Lake Champlain Trust Fund, support efforts to improve the lake environment. As discussed in the overview prefiled testimony of Jessome/Martin/Bagnato, based on feedback received from agencies, NGOs and members of the public, it is currently anticipated that a significant portion of the Fund will focus on projects that assist with the cleanup of phosphorus in the lake.

Furthermore, as discussed in the prefiled testimony of Seth Parker, the Project is anticipated to displace gas- and oil-fueled sources of electric generation supplying the region. This would result in the potential to regionally reduce greenhouse gas emissions, which have been identified as a potential cause of climate change. As noted in a report prepared by the Nature Conservancy in 2010 (see ***Exh. TDI-SM-5***), climate change could directly impact certain key aquatic ecosystems (including tributary systems, the deep lake and native fish assemblages) as well as magnify existing stressors on the lake environment.

Other Necessary/Collateral Permits

Q47. Can you please briefly identify, describe, and provide the status of other federal and state approvals necessary for construction and operation of the Project in Lake Champlain?

A47. Response: At the federal level, pursuant to Executive Order ("EO") 10485 of 1953, as amended by EO 12038, and 10 CFR Section 205.320, the U.S. Department of Energy

("DOE") has authority to review and approve the construction, operation, and interconnection of electric transmission facilities at the international border. DOE, therefore, will render a Presidential Permit decision for the proposed Project based on an evaluation of, among other things, potential impacts to electric reliability and environmental resources, including impacts to Lake Champlain To support its evaluation, DOE will prepare an environmental impact statement as required by the National Environmental Policy Act, and will consult with the U.S. Fish and Wildlife Service ("USFWS") and NOAA Fisheries as necessary with regard to any potential Project impacts to federal threatened and endangered species. TDI-NE submitted their Presidential Permit application in May of 2014.

Pursuant to Section 10 of the Rivers and Harbors Act of 1899 ("RHA"), 33 U.S.C. Section 403, and Section 404 of the Clean Water Act {"CWA"), 33 U.S.C. Section 1344, the U.S. Army Corps of Engineers ("USACE") will issue a permit authorizing certain aspects related to the construction of the Project. Section 10 of the RHA requires USACE approval prior to the commencement of construction activities in navigable waters of the United States. CWA Section 404 requires USACE approval prior to discharging dredged or fill material into jurisdictional waters of the United States, including wetlands. An application for these approvals was submitted in November of this year and will be supplemented before the close of the year.

At the state level, in addition to obtaining the Certificates of Public Good to construct and operate the Project (30 V.S.A. Section 248) and own and operate a transmission-related facility (30 V.S.A. 231) from the Vermont Public Service Board, approvals are required from other state agencies that are specific to water resources and Lake Champlain. The VT DEC is responsible for the issuance of the 401 Water Quality

Certificate (Clean Water Act Section 401) that is required when a federal permit, license or approval related to a discharge to navigable waters is involved. The Project will also require a shoreline encroachment permit (29 V.S.A. Chapter 11) based on the placement of the cables under the public waters of Lake Champlain. The Project will likely also require State Pollution Elimination Discharge Permits (10 V.S.A. § 1263) for some construction and operational activities. It is anticipated that TDI-NE will file applications for these permits in January or February of 2015.

Q48. Does this conclude your testimony at this time?

A48. Response: Yes.