

Lake Encroachment Individual Permit

Under 29 V.S.A. § 401 *et seq.*



VERMONT DEPARTMENT OF
ENVIRONMENTAL CONSERVATION
WATERSHED
MANAGEMENT DIVISION
LAKES & PONDS PROGRAM

<p>Permittee(s): Vermont Electric Power Company</p> <p>Waterbody: Lake Champlain</p> <p>Permit Number: 2016-007</p>	<p>Project Description: Cable Removal & Installation (PV-20)</p> <p>Project SPAN: 255-018-11127</p> <p>Project Location: 4A Champlain Landing, Grand Isle</p>
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Based upon the findings contained in this permit, it is the decision of the Department of Environmental Conservation (the Department) that the project described herein, as set forth in the following findings and in the application on file with the Department, complies with the criteria of 29 V.S.A. § 405 and is consistent with the public trust doctrine, and is hereby approved under the following conditions and specifications.

a. Specific Conditions

1. The Project shall be carried out in accordance with the final application received by the Department (the Approved Application); and the conditions and specifications of this permit. In any instance where there may be inconsistency between specific conditions and plans referenced in this permit and the general conditions, the permittee shall implement and adhere to the plan or condition that is most protective of Lake Champlain and the public trust. Any material deviation from these plans or substantial change in the Project must be approved by the Secretary.
2. The Permittee shall construct the Project in accordance with the requirements of the following plans as identified in the Approved Application. The Permittee shall not make any modifications or changes to those plans without prior consultation and approval of the Secretary:
 - A. Turbidity Monitoring Plan dated April 14, 2016;
 - B. Aquatic Invasive Species Management Plan dated April 1, 2016;
 - C. Horizontal Directional Drilling (HDD) Inadvertent Return Contingency Plan dated April 1, 2016;
 - D. Installation Spill Prevention, Containment, and Contingency Plan dated March 10, 2016; and
 - E. Removal Spill Prevention, Containment, and Contingency Plan dated April 1, 2016.
3. The Permittee shall conduct all lakebed disturbing activities to the period from June 1 to October 1. This restriction shall not apply to HDD activities, provided that these HDD activities are conducted in a manner that prevents the introduction of sediments into, or creation of turbidity within Lake Champlain (the "Lake") beyond the immediate vicinity of the in-water HDD entry point. For the purposes of this condition, "lakebed disturbing activities" includes activities related to both cable installation and cable removal, including laying of cable on the lakebed.
4. The Permittee shall not cause permanent removal of woody debris, trees, stumps, historical sawn logs, rock, aquatic plants, or animal life from the Lake during installation and removal activities without advance approval from the Secretary or as approved by this permit. Advance approval is not required for incidental removal of small items, including those of the type listed above, that may be attached to or cling to the cable or other equipment during removal activities. Aquatic invasive species shall not knowingly be removed from the Lake, or moved from one portion of the Lake to another portion of the Lake, except in accordance with the following: Aquatic invasive species that are inadvertently removed from the Lake during the cable-removal activities due to their attachment to the cables or other equipment shall not be transported on the outside of a vessel and shall only be transported and disposed of in a manner that will not cause reintroduction into the Lake or any other waters of the state of Vermont.
5. Following the Permittee's selection of a marine contractor, and a minimum of 90 days prior to commencement of construction, the Permittee shall submit to the Department a report summarizing the

approximate number and size of vessels necessary for Project construction, including the locations where vessels and other project equipment necessary for construction in the Lake will be staged, docked, launched, maintained, and fueled, including an assessment of any additional anticipated impacts, or changes to anticipated impacts from those identified in the Approved Application, on the public good or public trust uses on the Lake. The Permittee shall identify how additional impacts, if any, are addressed, and shall seek approval from the Secretary to modify the permit as necessary in accordance with Condition a.1. herein.

6. The Permittee shall establish turbidity thresholds in consultation with the Secretary for Levels 1, 2, and 3 as described in *Section 3.3 Proposed Action Levels* of the Turbidity Monitoring Plan dated April 14, 2016.

b. Standard Conditions

1. Completion of construction. The project authorized by this permit must be completed within 5 years of the effective date of this permit.
2. Permit modification. All permit modifications, shall be treated as a new permit application.
3. Erosion prevention and sediment control. Erosion prevention and sediment control best management practices shall be utilized and maintained to prevent erosion and control sediment to minimize and prevent adverse impacts to water quality during construction of the authorized project.
4. Spill prevention. Fuel and lubricants from equipment shall not be discharged into the water. Any spills shall be managed in accordance with all applicable local, state, and federal regulations.
5. Waste management. Any pieces of concrete, stone, construction debris, or other waste materials deposited into the lake during project implementation/construction shall be removed from the lake and disposed of properly, in accordance with all applicable local, state, and federal regulations.
6. Compliance with other regulations. This permit does not relieve the permittee from obtaining all other approvals and permits prior to commencement of activity or from the responsibility to comply with any other applicable federal, state, and local laws or regulations, including but not limited to the Vermont Solid Waste Management Rules, the Vermont Wetland Rules, and the Vermont Shoreland Protection Act.
7. Transfer of permit. Prior to transferring ownership over the encroachment authorized by this permit or the portion of property associated with the encroachment authorized by this permit, the permittee shall give the Department notice of the transfer. The notice shall include the name and contact information for the current permittee and prospective permittee, the proposed date of permit transfer, and a statement signed by the prospective permittee stating that he/she has read and is familiar with this permit and agrees to comply with and be bound by its terms and conditions.
8. Access to property. The permittee shall allow the Commissioner of the Department, or a duly authorized representative, at reasonable times and upon presentation of credentials, to enter upon permittee's property, or to otherwise access the authorized encroachment, if necessary, to inspect the project to determine compliance with this permit.
9. Legal responsibilities for damages. The Department, by issuing this individual permit, accepts no legal responsibility for any damage direct or indirect of whatever nature and by whoever suffered arising out of the approved project.
10. Rights and Privileges. This permit does not authorize any damage to private property or invasion of private rights or the violation of federal, state, or local laws or regulations. In addition, this permit does not convey any title or interest to the lands lying under public waters or waters affected.

11. Duty to comply and enforcement. The permittee shall comply with all terms and conditions of this permit. Any permit noncompliance shall constitute a violation of 29 V.S.A. Chapter 11 and may be cause for an enforcement action and revocation, modification, or suspension of this permit. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity to maintain compliance with the conditions of this permit.
12. Reopener. If, after granting this permit, the Department determines that there is evidence indicating that an authorized activity does not comply with the requirements of 29 V.S.A. Chapter 11, the Department may reopen and modify this permit to include different limitations and requirements.
13. Revocation. This permit is subject to the conditions and specifications herein and may be suspended or revoked at any time for cause including: failure by the permittee to disclose all relevant facts during the application process which were known at that time; misrepresentation of any relevant fact at any time; non-compliance with the conditions and specifications of the permit; or a change in the factors associated with the encroachment's effect on the public trust or public good so that on balance the Department finds that the encroachment adversely affects the public trust or public good.
14. Severance. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.
15. Appeals.
 - A. Renewable Energy Projects – Right to Appeal to Public Service Board. If this decision relates to a renewable energy plant for which a certificate of public good is required under 30 V.S.A. § 248, any appeal of this decision must be filed with the Vermont Public Service Board pursuant to 10 V.S.A. § 8506. This section does not apply to a facility that is subject to 10 V.S.A. § 1004 (dams before the Federal Energy Regulatory Commission), 10 V.S.A. § 1006 (certification of hydroelectric projects), or 10 V.S.A. Chapter 43 (dams). Any appeal under this section must be filed with the Clerk of the Public Service Board within 30 days of the date of this decision; the appellant must file with the Clerk an original and six copies of its appeal. The appellant shall provide notice of the filing of an appeal in accordance with 10 V.S.A. § 8504(c)(2), and shall also serve a copy of the Notice of Appeal on the Vermont Department of Public Service. For further information, see the Rules and General Orders of the Public Service Board, available online at www.psb.vermont.gov. The address for the Public Service Board is: 112 State Street, Montpelier, Vermont, 05620-2701; Telephone #: 802-828-2358.
 - B. All Other Projects – Right to Appeal to Environmental Court. Pursuant to 10 V.S.A. Chapter 220, any appeal of this decision must be filed with the clerk of the Environmental Division of the Superior Court within 30 days of the date of the decision. The Notice of Appeal must specify the parties taking the appeal and the statutory provision under which each party claims party status; must designate the act or decision appealed from; must name the Environmental Division; and must be signed by the appellant or the appellant's attorney. The appeal must give the address or location and description of the property, project, or facility with which the appeal is concerned and the name of the applicant or any permit involved in the appeal. The appellant must also serve a copy of the Notice of Appeal in accordance with Rule 5(b)(4)(B) of the Vermont Rules for Environmental Court Proceedings. For further information, see the Vermont Rules for Environmental Court Proceedings available at www.vermontjudiciary.org. The address for the

c. Findings

1. Jurisdiction - 29 V.S.A. § 403: Lake Champlain in Grand Isle is a public water of the state of Vermont. The project encroaches beyond the shoreline as delineated by the mean water level, 95.5 feet National Geodetic Vertical Datum (NGVD) 1929. Therefore, the Department has jurisdiction under 29 V.S.A. Chapter 11.
2. Application Receipt and Review - 29 V.S.A. § 404: On March 24, 2016, the Department received an application from the Vermont Electric Power Company (VELCO - permittee), under the provisions of 29 V.S.A. Chapter 11, for authorization to remove seven existing cables and install four new cables (PV-20) located within the public waters of Lake Champlain, Grand Isle.
3. Public Notification - 29 V.S.A. § 405(a): The Department gave written notice of this application to the municipality in which the proposed encroachment is located, abutting property owners, and others having an interest in this matter and provided an opportunity for interested persons to file written comments or request a public information meeting. The notice period began on May 31, 2016 and closed at 4:30 PM on June 29, 2016. No comments were received. No request for a public information meeting was received.
4. Background; Lake Encroachment Permit History: Lake Encroachment Individual Permit #1970-001 was issued on July 2, 1970 to the Vermont Electric Power Company for the installation of three 1,000 kcmil cables, installed in 1970 in Lake Champlain, Grand Isle.
5. Project Description: The overall Project includes the construction of new transition/terminal stations in Plattsburgh, New York (NYPA) and Grand Isle, Vermont (VELCO), installation of four new submarine cables, removal of the seven existing cables, and removal of the existing terminal stations (also referred to as substations). In addition, the Vermont portion of the Project will involve the replacement of one existing overhead utility line structure and installation of one new overhead utility line structure associated with VELCO's existing K20 line circuit. The new cable installation and existing cable removal work will extend beyond the mean water level of the Lake.
Existing Project Components: The seven existing PV-20 transmission line cables extend between the existing terminal stations on either side of the Lake and along the Lake bottom for approximately 1.6 miles, with 0.6 miles of cable length located in Vermont and the remaining 1.0 mile of cable length located in New York. Of the 0.6 miles located in Vermont, 0.56 miles of cable length is submarine with 0.04 miles of cable length being subterranean. The existing cables consist of four 2.9-inch diameter cables (including three cables to support the three phase circuit and one spare cable) installed in 1958, and three additional 3.4-inch diameter cables installed in 1970. One of the original cables failed in late 1969, at which point the spare cable was utilized to ensure the circuit remained operational. The three additional cables were added in 1970 to support the increasing load on the circuit. The cable that failed was abandoned in place and remains inoperable. The existing cables are an oil-filled design with gravity-fed oil reservoirs at each substation/ terminal station. In addition to the oil reservoirs, the existing VELCO terminal station consists of an approximate 40 by 50-foot gravel pad, which supports the structures and concrete foundations associated with the equipment for the terminal of the submarine cable to the overhead electric line. A small (approximately 10 by 12-foot) building is located within the terminal

station yard. The existing terminal station yard is completely fenced in and grass covered with the exception of the gravel pad.

New Cable Specifications: The Project involves the installation of four new, extruded dielectric (oil-free) submarine cables within an approximate 500-foot-wide corridor starting approximately 30 feet north of the northernmost existing cable and extending northward then westward within the Lake. Three cables will be operational to support the three phase circuit with the fourth cable being installed as a spare in the event of a failure. The new cables are estimated to be between 5 and 6 inches in diameter and weigh approximately 27 pounds per foot. The cables will have a load capacity of 230 kV, but will be operated at 115 kV, as restricted by the existing capacity of the K-20 circuit. The 230kV capacity cables are proposed in order to accommodate potential future upgrades to the remainder of the K-20 circuit. The cables will be suitable for use on AC high voltage circuits in dry or completely submersed operating conditions. Each cable will be supplied and installed as a continuous length. The conductor will be compact round copper, walled with a semi-conducting water blocking compound. Additional layers will include the conductor shield, insulation, insulation shield, metallic sheath, jacket, and armor. The cable and armor will be designed for a minimum service life of 40 years.

Installation Methods: Cable installation methods starting from the east at the terminal station to the west at the Vermont/New York state line within the Lake will include open trenching, horizontal directional drilling (HDD), jet sledding, and direct laying. The total proposed cable length within the Vermont portion of the Project from the terminal station to the Vermont/New York state line is approximately 0.7 miles per cable.

Open Trenching

The cables will be installed by open trenching from the terminal station to the manhole located approximately 270 feet from the shoreline defined by the mean water level (MWL). An Erosion Prevention and Sediment Control ("EPSC") plan will be submitted with the Construction Stormwater Permit Application, and measures will be used around the trenches to prevent stormwater runoff from exposed soil in accordance with the finalized and approved EPSC plan.

Horizontal Directional Drilling

HDD is a trenchless construction technique that will be used to avoid impacts to the Lake shore and nearshore habitat, to a water depth of approximately 30 feet. Each HDD will be approximately 894 feet in length, approximately 620 feet of which will be beyond the 95.5 foot MWL. The main equipment used for HDD include:

1. A directional drill rig sized for the Project, which will be located onshore;
2. Drill rods linked together to form a drill string for advancing the drill bit and for pulling back reamers and products, such as the plastic conduit;
3. A transmitter/receiver or wire line for tracking and recording the location of the drill and product;
4. A tank for mixing and holding drilling fluid;
5. A pump for circulating the drilling fluid and various pumping and centrifugal pumps/cyclones to recycle the drilling fluid and remove cuttings.
6. Gravity cell at exit point to contain fluids
7. Drill support barge, frac tank barge, and other support vessels

The HDDs involve a land based launch site and pull-back area that will be positioned approximately 270 feet from the mean water elevation of 95.5 feet where the directional drill rig will be staged and positioned to guide the drill along a planned path to an exit point within the Lake. An entry pit will be dug at the launch site to capture drilling fluid returns. A gravity cell, which is an open bottom and top

containment structure will temporarily be situated at the exit points in the Lake to confine drilling fluids or cutting material that may escape from the drill holes. The gravity cells are anticipated to be approximately 11 feet by 25 feet in size, and will be slowly lowered off the barge, using support lines from the barge until the gravity cell is located in the correct position on the lakebed. Drilling fluid will consist of a non-hazardous bentonite slurry (a combination of bentonite clay, water, and drilling additives). Safety Data Sheets (“SDSs”) for typical drilling mud additives are attached to the Inadvertent Return Plan provided in Appendix 3 of the Approved Application. The drilling fluid will be continually cleaned and recycled for use in the drilling operations. Based on site conditions associated with this project, the HDD installation will utilize a “Push Reaming” methodology. This process is visually presented and described in detail in the pictorial representation and Inadvertent Return Plan, respectively, which are provided in Appendix 3 of the Approved Application.

Jet Sledding

Jet sledding, also referred to as “jet plowing,” involves a skid-mounted jet sled which is towed by a barge. The jet sled uses pressurized water to fluidize the sediments to create a temporary trench, which allows the cables to settle to a specific desired depth then the sediments fall out of suspension back to the approximate original contours. The temporary trench will be approximately 1.5 feet wide by four feet deep. The Project proposes to bury the cables via jet sledding from approximately 30 feet of water depth to 100 feet of water depth, which equates to approximately 610 linear feet per cable.

Direct Lay

From water depths greater than 100 feet to the Vermont/New York state line, the cables will be directly laid on the Lake bottom for approximately 1,890 feet (0.36 miles) using a linear cable engine on a dynamically positioned barge to control the cable tension and placement.

Removal Methods

Once the new cables are installed, tested, and commissioned into service, the seven existing oil-filled cables will be removed. VELCO and NYPA have determined that complete removal of the cables is necessary to prevent a release of residual oil to the Lake, avoid potential future degradation issues, and avoid the need to remove them at a future date when their condition may have deteriorated further. Further, NYPA is committed to removing the cables per their existing easement agreement with the New York State Office of General Services. In addition, the U.S. Army Corps of Engineers (“USACE”) has also expressed a preference for complete removal of the cables. Prior to removal of the existing cables, the free-phase oil will be drained and purged with water, air or another innocuous material, to remove oil from within the cables. Purging activities will be conducted within a containment structure on land to protect immediately adjacent areas, including the Lake, from any potential incidental releases. Prior to purging the cables, the oil from the conservator tanks will be removed. A vacuum truck and air compressor will be used to purge the oil from the cables, and a minimum of three purging events for each cable are planned. Each purge event will consist of connecting a vacuum truck to the cable to draw the oil from the cable. The use of a vacuum truck and air compressor will be utilized separately or together to recover as much oil as possible. Second and third purge events will be completed following 36-hour waiting periods after each purge event. If significant oil is still recovered during the third purge event, additional purge events, as described, will be performed. Purged oil will be collected and disposed of in accordance with applicable state regulations. The removal contractor, Miller Environmental Group, has developed a Spill Prevention, Containment and Contingency Plan for the purging of oil and removal of the existing cables, which is provided in Appendix 3 of the Approved Application. The land portions of the cables will be removed via open trench excavation. Temporary impacts to the Lake may result from

trench excavation below the mean water level to uncover and remove the sections of cable where they enter the Lake. The cables enter the Lake as a group in a single trench that is 11 feet wide and separate into individual cables in a 1.5-foot-wide trench as they extend out about 250 feet into the water at a water depth of approximately 20 feet. Documentation indicates hand placed rip-rap, two feet thick and underlain by one foot of sand, covers the existing cables in the trenches. The material overlying the cables is proposed to be excavated from the existing trenches, and a total of approximately 305 cubic yards (CY) of rip-rap (204 CY) and sand (102 CY) is planned to be temporarily side cast adjacent to the cable trenches, prior to cable removal and then placed back into the excavated trench upon completion of cable removal activities. Within deeper portions of the Lake, divers will confirm, either by visual inspection or by remote operated vehicle, that the cables are free of any obstructions or debris. If significant amounts of sediment overlying the cables is encountered and determined to put unacceptable tension on the cable during extraction, diver-assisted water jetting efforts may be required to minimize sediment cover over the cables to facilitate extraction. The cable will then be secured to a spool, mounted on a work barge. The cable will be recovered from shore to the end of the rip-rap covered area at which point the barge will be spun about to allow for cable recovery from the bow of the vessel at which point the spool will reel up the cable directly off the Lake bottom, with little to no substantial lateral movement of the cable during removal. Once a cable has been fully recovered, the cable will be transferred onto a truck mounted spool on land, where it will be brought to a waste containment area for disposal preparation. VELCO anticipates that the barge and hoist cable removal rate will be approximately 800 feet per hour, or approximately 4 hours per cable for the portions that are bottom laid. The removal of all cables, including the portions covered with rip-rap, will take place over approximately 24 days, but may not be consecutive. Cable removal rates may be adjusted according to prevailing conditions, and therefore this timeframe is an estimate only. The general timeframe for cable removal work within the Lake is expected to occur between June 1 and September 30, 2018. Upon construction and commissioning of the new terminal station, the existing station and equipment will also be decommissioned.

Planned Work Schedule

Construction activities are anticipated to commence in 2016 and continue through 2018 with operation of the new cables and terminal stations commencing in 2017 and removal activities completed in 2018. Specifically, VELCO anticipates the following timeline for Project activities scheduled to occur in Lake Champlain:

1. Gravity cell use related to the HDD activities: September 1, 2016 through November 15, 2016
2. Vessel and Equipment Mobilization prior to new cable installation: April 1, 2017 through June 20, 2017
3. Cable Installation: June 1, 2017 through July 31, 2017
4. Cable Removal: June 1, 2018 through August 30, 2018

This schedule may be subject to change due to unanticipated conditions, however the Project is committed to limiting in-lake construction activities, such as jet sledding, direct laying, and removal, to between June 1 and October 1 of a calendar year.

6. Project Purpose: The purpose of the project is to replace the seven existing cables with four new cables prior to any failures as the existing cables have been identified as approaching the end of their design life and are regarded as being at risk for long term continued service.
7. Effect of Encroachment – Whether Excessive for Stated Purpose: The Project is not excessive for the stated purpose.

8. Effect of Encroachment – Less Intrusive Feasible Alternatives: Prior to developing the detailed design of the Project, VELCO considered a number of potential alternatives to the current Project in order to determine if one alternative would accomplish the Project purpose and result in fewer impacts to sensitive resources (e.g., aquatic and other natural resources, cultural resources, aesthetics). VELCO considered alternative Project locations and installation techniques for the construction of the replacement cables to determine the preferred methods that would result in the fewest impacts to the environment. The combination of proposed installation methods represents the least intrusive alternative by:
1. Avoiding impacts to the shoreline by using HDD,
 2. Avoiding impacts to the cable itself and to recreation by burying the cable below the lakebed in shallow waters (less than 100 feet deep), and
 3. Directly laying the cable on the lakebed in deeper waters (greater than 100 feet deep) to avoid impacts associated with resuspension of sediment.

9. Effect of Encroachment – Measures to Reduce Impacts on Public Resources: Measures will be used to limit the Project’s potential impact on the natural environment during installation. These include the overall Project design, installation methods, proposed installation inspection and monitoring, and spill prevention planning and response for hazardous materials.

Overall Project Design and Installation/Removal Methods

The Project itself is being proposed as a means to reduce the potential adverse impacts on the Lake by removing and replacing the existing oil-filled cables with oil-free cables. Oil will be drained and purged from the cables with an innocuous material prior to the cable removal in order to avoid the risk of a release during removal. Purged oil will be collected and disposed of in accordance with applicable state regulations. The removal contractor, Miller Environmental Group, has developed a spill prevention, containment and contingency plan (or similar) for the purging of oil and removal of the existing cables, which is provided as Appendix 3 of the Approved Application. The Lake crossing route represents the shortest distance between the New York and Vermont terminal stations, and as discussed in Section 4.0 and the Alternatives Analysis provided in Appendix 4 of the Approved Application, alternative terrestrial routes and installation methods would likely result in greater impact to the natural environment. With the Lake route being the most feasible alternative, VELCO completed several environmental assessments within the proposed Project corridor and designed the route using selected installation methodologies that will avoid or limit adverse impacts to water quality, aquatic habitat, and cultural resources while meeting the Project objectives. These environmental assessments have concluded that sensitive aquatic habitats and cultural resources do not exist within the Project corridor. The following prevention measures related to the proposed installation methods include:

HDD:

- The use of HDD technology to enter the Lake will reduce impacts to the shoreline and near shore habitat.
- HDD equipment and laydown area will be set back over 270 feet from the mean water level of the Lake.
- The HDD launch pit will be constructed to contain drilling fluids at the entry point of the HDD borehole.
- A temporary gravity cell will be used at the exit point within the Lake to collect drilling fluid and prevent it from entering the Lake beyond the gravity cell.
- The contractor will pump out drilling fluid from the gravity cell prior to it being removed from the Lake.
- EPSC measures to be installed on land around the HDD launch pit as needed.

Jet Sled

The use of jet sled installation technologies will limit the Project's potential impact to water quality. Compared to traditional mechanical dredging and trenching operations, use of the jet sled for aquatic cable installation is considered the most effective and least environmentally damaging installation method for this Project. This method allows for the simultaneous laying and burying of the cables, resulting in a short duration of Lake bottom disturbance. The fluidized sediment is expected to settle back into the trench following installation, resulting in the approximate original contours of the Lake bottom. This method is being proposed for water depths between 30 feet and 100 feet in order to protect the cables and avoid impacts to anglers or boaters that may fish or anchor at these depths.

Direct Lay

Directly laying the cables on the Lakebed in deeper waters (greater than 100 feet in depth) avoids potential temporary water quality impacts related to sediment resuspension. This method is the least invasive, but is only proposed in deeper waters because cables located in shallow waters (less than 100 feet depth) are more susceptible to impacts from anchoring and other recreational use.

Installation/Removal Prevention Plans and Monitoring

HDD – Drilling Fluid and Inadvertent Returns

HDD installation methodology involves the circulation of drilling fluid in the borehole to reduce friction, hydraulically excavate soil, provide borehole stabilization, and provides other key functions. In ideal circumstances, the drilling fluid flows back to the entry through the drilled annulus. However, existing fractures in sediment or rock can provide a path of least resistance for fluid to escape the borehole, resulting in discharge of fluids at a location other than the entry or exit points. This unintentional release is referred to as an "inadvertent return." The risk of inadvertent returns can be avoided or reduced through the implementation of best management practices, including prevention planning and continuous monitoring. The impacts of a potential inadvertent return can also be reduced or mitigated through the implementation of a response plan. An Inadvertent Return Contingency Plan provided as Appendix 3 of the Approved Application describes procedures and contingency measures in the event of an inadvertent return during HDD operations.

Hazardous Materials

The installation of the aquatic cable would require the transport, handling, use, and onsite storage of hazardous materials and petroleum products, primarily associated with the operation of the equipment and vehicles. To avoid potential impacts from hazardous materials and wastes, VHB and CHA have prepared a Spill Prevention, Containment, and Countermeasure Plan that describes the spill prevention and contingency methods and procedures to be utilized for the Project, which is provided in Appendix 3 of the Approved Application. The removal contractor, Miller Environmental Group has developed a spill prevention, containment and contingency plan (or similar) for the purging of oil and removal of the existing cables, which is also provided in Appendix 3 of the Approved Application.

Installation Inspection/Monitoring

During portions of installation, a qualified Environmental Inspector will be on-board the installation vessel and responsible for monitoring. A temporary and limited amount of sediment resuspension is expected due to the installation via jet sled. Sediment resuspension within the Lake will be visually monitored at the surface of the water from support vessels, in addition to real-time in-situ turbidity monitoring which will be conducted in accordance with the Turbidity Monitoring Plan ("TMP"), provided in Appendix 3 of the Approved Application. As indicated in the TMP, VELCO will work with ANR to establish turbidity thresholds that would trigger the need to consider additional environmental

protective measures, such as changing the rate of jet sled installation, modifying hydraulic pressures, or implementing other reasonable operational controls that may reduce suspension of sediments.

Aquatic Invasive Species Management

The nature of the Project requires the transport of marine vessels into Lake Champlain via overland or the Champlain Hudson Lock System. The transport of marine vessels/equipment from one waterbody to another poses the risk of introducing new aquatic invasive species (“AIS”) to the Lake. Where possible, overland transport will avoid the risk of AIS as it prevents the need to bring vessels in through the Champlain Hudson canal system. Equipment is planned to be transported to the Lake on tractor trailers overland and assembled at a marina on the lake or via the vessels traveling through the Champlain Hudson canal system (e.g. deck barges, transport barges). Materials for the Project are also planned to be transported to the Project site overland, with the exception of the replacement cables. The replacement cables will be manufactured in South Korea and transported to a port in New Jersey or New York, where each of the four cables will be unloaded from the ocean vessel and placed within a specially designed barge for transport to the Lake through the Champlain Hudson canal system. An AIS Management (“AISM”) Plan prepared in consultation with the contractors is included as Appendix 3 of the Approved Application, and includes more information regarding vessel types, precautionary measures, and decontamination procedures.

- 10.** Placement of Fill: Temporary impacts to the Lake substrate associated with dredge and/or fill material include the temporary installation of four 11 foot by 25-foot gravity cells to facilitate the in-Lake HDD portion of cable installations, and the excavation and side casting of rip-rap material to facilitate cable removal. No in-Lake utilities currently intersect the Project Area, however, if other proposed in-Lake utilities are installed prior to the PV-20 cable installation, articulated concrete mats or other protective structures will be placed over the existing lines underlain by grout bags to protect both the existing utility and the Project cables, which would be considered permanent impacts. Based on this, temporary and permanent impacts to the Lake resulting from Project implementation have been calculated, and are summarized follows:
- Temporary: Gravity Cell (4) x (11-foot x 25-foot); 1,100 square feet
 - Temporary: Existing Cable Removal – Rip Rap Side Casting (approx. 15-foot-wide corridor for temporary rip-rap placement); 7,500 square feet
 - Temporary: Trench Excavation (approx. 11-foot-wide trench to uncover existing cables); 5,500 square feet
 - Permanent: Articulated Concrete Mats (20) x (8-foot x 40-foot); 6,400 square feet
 - Temporary: Rip-rap removal from trench and replacement after cables are removed; 204 cubic yards
 - Temporary: Sand removal from trench and replacement after cables are removed; 102 cubic yards
- 11.** Effects on Water Quality - 29 V.S.A. § 405(b): VELCO completed studies to characterize Lake conditions and assess the Project’s potential impacts on natural resources in the Lake during construction. Analysis of potential impacts to surface waters included the assessment of impacts to Lake Champlain that may result from the installation of the submarine cables, including the potential resuspension of lakebed sediments. As presented in VHB’s VELCO PV-20 Lake Champlain Crossing Water Quality Assessment Memorandum (“PV-20 Technical Memorandum”; Appendix 4 of the Approved Application), the analysis of available Lake water quality data, Project-specific data (Appendix 4), and the review of water quality modeling efforts recently completed for a comparable electric transmission line project, demonstrate that the installation of the proposed PV-20 Project will not result in adverse impacts to water quality of

the Lake. Specifically, it was identified that limited temporary and localized total suspended solids (“TSS”) and total phosphorus (“TP”) levels will increase in the overlying water column during installation, however these limited increases are expected to occur for only a short duration during cable installation, with a rapid decline immediately following installation, and will not result in an exceedance of the Vermont Water Quality Standards (“VWQS”). Also, based on project-specific sediment data and analysis presented in the PV-20 Technical Memorandum (Appendix 4), the installation also will not result in the release of metals or other pollutants from the sediment into the overlying water column in concentrations that exceed the VWQS. As presented in the PV-20 Technical Memorandum, the comprehensive review of relevant available datasets and model outcomes, in addition to Project specific studies, indicates that the installation of the Project will not result in undue adverse effects to water quality and will maintain compliance with all applicable VWQS criteria.

Operation

The transmission of energy through the cables will result in heat loss from the cables to the surrounding environment. As summarized in the PV-20 Technical Memorandum and detailed in CHA’s “Estimated Thermal Discharge for Existing and Proposed Cables Memos” provided in Appendix 4 of the Approved Application, thermal modeling of the PV-20 cables during operation indicates that the new cables will operate at lower temperatures than the existing cables, thus having less impact to the water surrounding the cables. This modeling further identified that water temperature increases from cable operation will remain below one-degree F at 0.4 inches from the cable and will have a zero-degree temperature change on the water at 0.5 inches from the cable and beyond. Therefore, the Project specific temperature modeling indicates that the operation of the Project will not result in undue adverse effects to water quality and will maintain compliance with applicable VWQS temperature criteria. The new cables will result in a decrease in the maximum magnetic field compared to the existing cables. The results of magnetic modeling are summarized in the PV-20 Technical Memorandum and in the “Calculated Magnetic Field Levels for the PV-20 Submarine Cable Replacement Project” prepared by Electrical Consulting Engineers, P.C., and provided in Appendix 4 of the Approved Application.

Removal

Prior to removal of the existing cables, the free-phase oil will be drained and purged with water or another innocuous material, such as air, to remove oil from within the cables. Purging activities will be conducted within a containment structure on land to protect immediately adjacent areas, including the Lake, from any potential incidental releases. Removal of the oil-filled cables eliminates potential future water quality impacts associated with the cables remaining within the Lake. The removal contractors have prepared a Spill, Prevention, Containment, and Contingency Plan (Appendix 4), and based on the proposed design/approach and protective measures described in the plan, the Project will not result in undue adverse water pollution.

Turbidity Monitoring

Although modeling indicates that resuspended sediment resulting from the jet sled installation will be limited in extent and duration, VELCO will monitor turbidity in the Lake on the north and south sides of the Project corridor, and in between the Project and the water intake that supplies the Grand Isle Consolidated Water District and the Vermont Fish & Wildlife Ed Weed Fish Hatchery. The TMP has been prepared in consultation with DEC and the Vermont Fish & Wildlife Department (FWD), and VELCO will continue to work with DEC and the FWD to establish acceptable turbidity thresholds at the proposed monitoring locations.

- 12.** Effects on Fish and Wildlife Habitat - 29 V.S.A. § 405(b): No significant or measurable impacts on fish and wildlife habitat are anticipated as a result of the construction or operation of the Project. VELCO retained EcoLogic, LLC of Syracuse, New York to complete an aquatic habitat and biota assessment for the Project corridor. It was identified that the Project corridor that would not provide exceptional value for fish spawning or nursery areas, and therefore the Project corridor within the Lake does not represent critical habitat. The FWD also indicated that Rare, Threatened, or Endangered mussel species are not known to occur in this section of the Lake, which was confirmed by EcoLogic's field assessment. In addition, VELCO will avoid potential impacts to fish spawning by limiting significant Lakebed disturbing activities to timeframes generally outside of potential fish spawning periods.
- 13.** Effects on Aquatic and Shoreline Vegetation - 29 V.S.A. § 405(b): Adverse impacts to aquatic vegetation are expected to be short-term during Project implementation and will be limited to the immediate project work area where aquatic vegetation may be present. Aquatic vegetation that is disturbed during Project implementation is expected to recolonize once the Project is completed. It is not anticipated that there will be adverse impacts to existing shoreline vegetation as the existing tree line between the proposed terminal station and the Lake will be retained. Existing cleared areas located above mean water level will be utilized for on shore Project implementation and will not be expanded.
- 14.** Effects on Navigation and Other Recreational and Public Uses, Including Fishing and Swimming - 29 V.S.A. § 405(b): Once the Project has been completed, there are no anticipated adverse impacts on navigation and other recreational and public uses. During periods of in-Lake work (installation and removal), VELCO anticipates temporary, moving no-travel safety work zones around the HDD and cable laying and recovery barges. The alternating current through the cables will emit magnetic fields, but the magnetic field will not affect compass readings or operation of recreational vessels (refer to Technical Memorandum and the Magnetic Fields Memorandum, Appendix 4 of the Approved Application). In addition, the magnetic fields from the new cables will be less than the existing cables.
- 15.** Consistency with the Natural Surroundings - 29 V.S.A. § 405(b): Once the Project has been completed, the Project will not be visible from above the Lake surface, and will not involve the removal of shoreline vegetation, and therefore will be consistent with the natural surroundings.
- 16.** Consistency with Municipal Shoreland Zoning Ordinances and Applicable State Plans - 29 V.S.A. § 405(b): No adverse comments were received during the investigation from local and state officers and the project is therefore considered to be consistent with municipal shoreland zoning ordinances and applicable state plans.
- 17.** Cumulative Impact - 29 V.S.A. § 405(b): The Project is not expected to result in an additional adverse cumulative impact after cable installation and removal has been completed.
- 18.** Public Good Analysis Summary - 29 V.S.A. § 405(b): Based upon findings c. 11-17, the project will not adversely affect the public good. Overall, the proposed project will not adversely affect the public good.
- 19.** Public Trust Analysis: The public trust doctrine requires the Department to determine what public trust uses are at issue, to determine if the proposal serves a public purpose, to determine the cumulative effects of the proposal on the public trust uses, and to balance the beneficial and detrimental effects of the proposal. The public trust uses relevant to this proposal are fishing, boating, boating-related recreation, swimming, navigation, commerce, environmental preservation, environmental research, domestic water supply, utility transmission, and fish culture. The impacts of the project on public trust uses includes temporary disruption of public trust uses in the immediate work area during project implementation as well as potential impacts to water quality, which primarily consists of potential turbidity issues and the close proximity of the Ed Weed Fish Culture Station's deep-water intake pipe. The

PV-20 project provides public benefits in the form of removing existing marine cables that are at risk of failure and replacing them with modernized marine cables. The cable removal and installation will ensure continued operation of the utility without disruption of services to the public. The benefits to the public are considered to outweigh the temporary and geographically limited negative impacts during Project implementation. The Department has therefore determined that the project is consistent with the public trust doctrine.

d. Authorization

Based upon the foregoing findings, and in consideration of the Department's Interim Procedures for the Issuance or Denial of Encroachment Permits, dated October 4, 1989, excluding Section 3, which was invalidated by Lamoille County Superior Court, Docket No. S96-91, 9/04/92, it is the decision of the Department that the project described herein, as set forth in the above findings and in the plans on file with the Department, complies with the criteria of 29 V.S.A. § 405, and is consistent with the public trust doctrine.

In accordance with 29 V.S.A. § 401 *et seq.*, the Department hereby issues this decision and permit to the Vermont Electric Power Company for the above named project. The Department has approved the project subject to the conditions contained herein.

This permit shall not be effective until 10 days after the Department's notice of action and permit issuance in accordance with 29 V.S.A. § 405(c) and shall expire 15 years thereafter. **Prior to the expiration of this permit, the permittee shall reapply for a lake encroachment permit, if the permittee wishes to maintain the encroachment authorized by this permit.** If the permittee wishes to modify the encroachment or conduct other jurisdictional activities not authorized by this permit, the permittee must submit a new permit application.

Alyssa B. Schuren, Commissioner
Department of Environmental Conservation

By: _____
Perry Thomas, Program Manager
Lakes & Ponds Management and Protection Program