



Memorandum

To: VELCO Highgate Substation  
Project File

Date: August 30, 2022

Project #: 58456.00

From: Ryan M. Scott, CPESC, PWS,  
Senior Ecologist

Re: Section 248 Natural Resources Assessments

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At the request of Vermont Transco LLC and Vermont Electric Power Company (collectively, "VELCO"), VHB conducted natural resource investigations and impact/environmental permitting assessments in support of condition-based substation upgrades as part of VELCO's Substation Condition Assessment Project (the "Project"). The Project is located at 2731 VT Route 78 in Highgate, Vermont, as indicated on the Natural Resource Map in Attachment 1. This technical memorandum includes a description of the proposed Project, site conditions within the Study Area (as defined below), a description of the individual methodologies for each resource assessment, the findings, and an evaluation of the Project with respect to each criterion per the applicable 30 V.S.A. §248(j) natural resource criteria reviewed by the Vermont Public Utility Commission ("PUC"). Though findings are described within the overall Study Area, a review of potential impacts is limited to the Project, which focuses on improvements to the existing Highgate Substation located north of VT Route 78 and the associated temporary construction support areas.

The natural resource assessment that VHB conducted in support of the Project included database reviews as well as field study, and was designed to include an evaluation of the following Act 250 Criteria, which are incorporated into the Section 248 review:

- Outstanding Resource Waters (10 V.S.A. § 1424a(d))
- Greenhouse Gas Impacts (30 V.S.A. § 248(b)(5))
- Water and Air Pollution (10 V.S.A. § 6086(a)(1))
- Headwaters (§ 6086(a)(1)(A))
- Waste Disposal (10 V.S.A. § 6086(a)(1)(B))
- Water Conservation (10 V.S.A. § 6086(a)(1)(C))
- Floodways (§ 6086(a)(1)(D))
- Streams (§ 6086(a)(1)(E))
- Shorelines (§ 6086(a)(1)(F))
- Wetlands (§ 6086(a)(1)(G))
- Water Supply (10 V.S.A. § 6086(a)(2) and (3))
- Soil Erosion (10 V.S.A. § 6086(a)(4))
- Rare and Irreplaceable Natural Areas ("RINA") (§ 6086(a)(8)), and Necessary Wildlife Habitat and
- Endangered Species (§ 6086 (a)(8)(A))
- Primary Agricultural Soils 10 V.S.A. § 6001(15)

In making assessments of Project impacts or conformance with the applicable criteria, VHB relied substantially on Project plans prepared by VELCO dated August 23, 2022.



## **SITE DESCRIPTION**

As depicted on the Natural Resource Map in Attachment 1, VHB's Study Area encompasses approximately 56 acres and is focused on VELCO-owned property in the vicinity of the Project. The Project will be limited to a subset of the area reviewed and is focused around the existing substation located north of VT Route 78, including the areas necessary for the substation rebuild, associated overhead utility line work required to support substation upgrades, and temporary laydown areas. VHB conducted natural resource assessments on May 8, 2020 and September 2, 2020 and a site visit with the U.S. Army Corps of Engineers ("USACE") and the Agency of Natural Resources ("ANR") was conducted on September 25, 2020 to review delineated wetland boundaries and proposed wetland classifications.

The site consists of the Highgate Substation, the Highgate Converter station, overhead electric utility rights-of-way ("ROW"), and undeveloped forested land. The Study Area is bisected by VT Route 78 and is accessed by gravel drives. Surrounding land use consists of rural residential and agricultural land. Representative photographs are provided in Attachment 2.

The Study Area occurs in the northern extent of the Champlain Valley biophysical region of Vermont [from *Wetland Woodland Wildland: a Guide to the Natural Communities of Vermont* (Thompson, et. al. 2019)], partially within the Missisquoi River sub-basin (HUC 8 – 04150407) and with the remainder in the Lake Champlain sub-basin (HUC 8 – 04150408). According to the Natural Resources Conservation Service ("NRCS"), the mapped soils within the Study Area include Raynham silt loam (3 to 8 percent slopes), Windsor loamy fine sand (3 to 8 percent slopes and 25 to 60 percent slopes), Farmington loam (8 to 15 percent slopes), and Enosburg fine sand (0 to 3 percent slopes). The topography within the Study Area is generally flat near the existing substation and converter station, but slopes towards the Missisquoi River moving south within the Study Area. Elevations range from 330 feet above mean sea level ("amsl") in the northern portion of the Study Area to 200 feet amsl at its southern extent. There are no wetlands mapped by the Vermont Significant Wetlands Inventory ("VSWI") but there are two streams mapped by the Vermont Hydrography Dataset ("VHD"). Representative photographs of the Study Area are included in Attachment 2.

## **PROJECT DESCRIPTION**

As part of a standard asset condition evaluation, VELCO identified the need to replace certain equipment associated with the existing substation, primarily due to condition and age, but design standards and operating practices were also taken into consideration. VELCO proposes to address most of the substation concerns by replacing the existing control building with a larger control building. This work requires an adjustment to the existing driveway and a five foot eastward expansion of the existing fence for approximately 90 feet. Project is limited in size and scope and VELCO will perform its substation upgrades predominately within previously disturbed lands. Most of the project-related upgrade work is located within the existing substation fence, with the main exceptions consisting of a minor fence expansion, a driveway re-alignment (shortening), wastewater treatment, temporary construction support areas, and VEC pole relocation. VHB understands the major Project components to include:

- Replace the existing 24-foot by 61-foot VELCO control building with a new, approximately 32-foot by 80-foot control building that will accommodate a protection and control system, station service, DC battery systems communication equipment, and security systems. The new control building will be located inside



the existing the substation. Installation of a new onsite wastewater treatment system and water supply well for the control building bathroom and eye wash station;

- Relocate the entry gate approximately 40 feet to the south, and adjust the existing driveway by regrading, widening, and shortening the driveway to accommodate the new entry gate;
- Expand a 90-foot portion of fence on the fence's eastern side to accommodate the new control building; VELCO proposes to expand the fence approximately 5 feet to the east;
- Install wastewater system north of the existing substation and within the existing transmission line rights-of-way;
- Relocate VEC's existing 46 kV wires and pole just outside the east side of the fence to accommodate the new control building; and
- Temporary construction support areas located south, east and north of the existing substation along the existing driveway, and within the adjacent, existing transmission line corridors.

## **SECTION 248 NATURAL RESOURCES CRITERIA**

### OUTSTANDING RESOURCE WATERS (10 V.S.A. § 1424a (d))

The Vermont Water Quality Standards ("VWQS", effective January 15, 2017) (ANR 2017a), under section 1-03D, state that the Secretary of the Vermont Agency of Natural Resources ("ANR") may, under 10 V.S.A. Section 1424(a), designate Outstanding Resource Waters ("ORW"). The following waterways have been classified as ORWs:

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

The Study Area was reviewed against this list to determine if it is located within the vicinity of any listed ORWs. The Project is located in the Missisquoi River watershed, which is not designated as an ORW.

As such, there are no ORWs which intersect or are in the vicinity of the Study Area, therefore the Project will not result in any impacts to resources included for review under this criterion.

### GREENHOUSE GAS IMPACTS (30 V.S.A. § 248(b)(5))

This criterion requires that the Project will not result in undue greenhouse gas emissions. For the Project, VHB's consideration of this criterion is limited to the construction phase of the proposed work as the substation, when in operation, will not emit greenhouse gases. Construction phase impacts will include emissions from vehicular traffic entering and existing the Site, as well as construction equipment associated with site work and equipment operation. This work will not have any undue impacts resulting from greenhouse gas emissions.

### WATER AND AIR POLLUTION (10 V.S.A. § 6086(a)(1))

This criterion requires that the Project result in no undue water or air pollution. The Project will address surface water pollution through Best Management Practices ("BMPs"), which are described further in the Soil Erosion and Waste Disposal section of this memorandum and will not result in undue water pollution. Further, VHB understands that the Project will obtain necessary permits for wastewater treatments associated with a single bathroom, sink and eyewash within the new control building.



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As described above, once in operation, the Project will have no component that will generate air pollution or require an air pollution control permit from ANR Air Quality and Climate Division. Minor temporary emissions associated with vehicular traffic and construction equipment operations are expected during the construction phase, though they are not anticipated to be significant. Dust generated during the construction phase of the Project will be controlled by applying water to work areas, as needed, in accordance with VELCO's Environmental Guidance Manual ("VEGM") and applicable BMPs. Through the use of applicable BMPs, the Project will not generate under air pollution.

### HEADWATERS (§ 6086(a)(1)(A))

VHB analyzed available information, including soils data, topographic maps, and state-mapped public water supply source protection areas, and conducted a field review, to determine if the Study Area is located on any lands that meet the Headwaters criterion of V.S.A. §6086(a)(1)(A) as incorporated in the Section 248(b)(5) review. If located in a headwater, a project is required to meet any applicable health and environmental conservation department regulations regarding reduction of the quality of the ground or surface waters flowing through or upon lands that are not devoted to intensive development, which the Study Area is not. The sub-categories for headwaters are as follows:

- i. Headwaters or watersheds characterized by steep slopes and shallow soils; or
- ii. Drainage areas of 20 square miles or less; or
- iii. Above 1,500 feet elevation; or
- iv. Watersheds of public water supplies designated by ANR; or
- v. Areas supplying significant amounts of recharge waters to aquifers.

The Study Area is located north of the Missisquoi River and within the Missisquoi River watershed, which at the point of Site discharge has a drainage area of approximately 817 square miles. Additionally, VHB reviewed the Agency of Natural Resources Atlas and confirmed that there are no public water supplies or associated source protection areas (SPA) within the Study Area. Therefore, it is VHB's opinion that it is not located within a headwater due to Project's proximity of the Missisquoi River.

Even though it is VHB's judgment the Site should not be considered a Headwaters location, the construction contractor will be required to take necessary measures to protect water quality, particularly with regard to stormwater management during construction activities, approved through a Vermont Construction General Permit 3-9020, if required, and implementation of practices in the Low Risk Site Handbook for Erosion Prevention and Sediment Control (ANR 2020b), to meet the 2017 Vermont Water Quality Standards ("VWQS") (ANR 2017a). In addition, pertinent pieces of the VELCO Environmental Guidance Manual ("VEGM") will be implemented to avoid discharges tied to stormwater. The existing substation has an Spill Prevention Control and Countermeasures ("SPCC") Plan which will be updated for the proposed work. An Operational Stormwater Permit is not required for the Project, as the total resulting impervious surfaces will be less than one acre. The proposed project upgrades and associated temporary construction support areas will result in no reduction of ground or surface water quality from the construction and/or operation of the proposed Project activities, and no undue adverse impacts to headwater areas.

### WASTE DISPOSAL (10 V.S.A. § 6086(a)(1)(B))



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The Waste Disposal criterion requires that a project meet applicable health and DEC regulations regarding the disposal of waste, and not involve the injection of waste materials into ground water or wells. For the Project, VHB's consideration of waste disposal involves sanitary wastewater, stormwater runoff, and general construction debris.

VELCO will dispose of all construction debris that cannot be re-used or recycled in accordance with Vermont Department of Environmental Conservation ("DEC") waste management rules and BMPs. A site-specific SPCC Plan was developed for the existing Highgate Substation, which will be updated to reflect the proposed substation changes, as required. The SPCC Plan provides detailed spill response information in the event of a release of oil and outlines storage capacities, types of oil stored, and secondary containment systems. In addition, the VEGM outlines spill response procedures for operational oil-filled equipment at the site and requires all contractors to maintain response kits to respond to incidental spills associated with construction activities and equipment. As noted earlier, the Project will not require an operational stormwater permit and will obtain a construction stormwater permit if required. If a construction stormwater permit is not required, VELCO will implement BMPs as described in the Headwaters criteria section.

As described above, the Project will meet the applicable health and VT DEC regulations regarding the disposal of waste, and does not involve the injection of waste materials into groundwater or wells. VELCO will obtain and comply with the necessary Wastewater and Potable Water Supply Permit from ANR for the proposed onsite wastewater treatment system. Therefore, the Project will not have an undue adverse effect to the environment associated with waste disposal.

### WATER CONSERVATION (10 V.S.A. § 6086(a)(1)(C))

Under this criterion, the Project design must consider water conservation, incorporate multiple use or recycling where technically and economically practical, utilize the best available technology for such applications, and provide for continued efficient operation of these systems. VELCO will install a new bathroom within the proposed control building, it will consist of a low-flow toilet and fixtures for water conservation. Water is also likely to be used during the construction phase of the Project for dust control, and establishment of vegetation, if required. Water use during the construction phase will be limited and temporary in nature. Given the limited amount of water use during the construction and operational phase of the Project, there will be no undue adverse effect to water conservation.

### FLOODWAYS (§ 6086(a)(1)(D))

The Act 250 Floodway criterion (10 V.S.A. § 6086(a)(1)(D)), as incorporated into Section 248 review, takes into consideration a project's effect on both floodways and floodway fringes. The term "floodway" is defined to mean "the channel of a watercourse which is expected to flood on an average of at least once every 100 years and the adjacent land areas which are required to carry and discharge the flood of the watercourse." (10 V.S.A. § 6001(6)). The term "floodway fringe" is defined as "an area which is outside of a floodway and is flooded with an average frequency of once or more in each 100 years." (Id. § 6001(7)). Floodway fringe is synonymous with other commonly used terms, such as 100-year floodplain, and flood (inundation) hazard area. A project's impacts are considered with respect to both flood inundation and fluvial erosion hazards pursuant to ANR Flood Hazard Area and River Corridor Protection Procedure ("FHARC Procedure") (ANR 2017b).

The Flood Hazard Area and River Corridor Protection Procedure addresses both inundation risks as represented by Federal Emergency Management Agency ("FEMA")-mapped flood information and potential fluvial erosion risks associated with the geomorphic principles necessary to achieve stable fluvial processes. The River Corridor consists of the meander belt or fluvial erosion hazard area, which is defined as the lateral width of a stream corridor that may be



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subject to fluvial erosion from stream channel lateral migration as well as a 50-foot buffer outside of this meander belt (ANR 2017b). If River Corridor is not mapped by the State, VHB assigns a 50-foot River Corridor to perennial streams.

VHB reviewed the available FEMA data for the Town of Highgate (Flood Insurance Rate Map – Panel #500055 0015 B), floodway and other special flood hazard data, as well as river corridor mapping from ANR, in order to determine if the Study Area is situated within floodway areas.

Based on this review, the Study Area is located outside of federally- and state-mapped Flood Hazard Areas and River Corridors. In addition, VHB did not map any perennial streams requiring an assigned 50-foot River Corridor within the Study Area, and no streams are mapped proximal to the Project. As such, the Project would not restrict or divert the flow of floodwaters (floodway or floodway fringe) or increase the peak discharge of the river, or endanger the health, safety, and welfare of the public, riparian, or downstream landowners during flooding or from potential erosion.

### STREAMS (§ 6086(a)(1)(E))

This Act 250 criterion, as incorporated into Section 248 review, requires that projects will, when feasible, maintain natural stream channel condition, and will not endanger the health, safety, or welfare of the public or adjoining landowners (10 V.S.A. § 6086(a)(1)(E)). VHB conducted stream delineation and assessment work on May 8, 2020 to map any onsite stream channels.

VHB conducted stream delineations pursuant to the ANR Guidance for Agency Act 250 and Section 248 Comments regarding Riparian Buffers (“ANR Riparian Buffer Guidance”) (ANR 2005). Stream determinations and Ordinary High Water (“OHW”) width follow guidance provided in the United States Army Corps of Engineers (“USACE”) Regulatory Guidance Letter: Subject - Ordinary High Water Identification (USACE 2005). Stream Top of Bank (“TOB”) and Top of Slope (“TOS”) are flagged in the field per ANR 2005. Stream TOB and TOS are flagged on larger channels and stream center-line is flagged for smaller channels and labeling includes the stream ID and flag number. OHW limits are flagged when applicable. Stream flow regimes are preliminarily classified as ephemeral, intermittent, or perennial and are determined based on qualitative observations of instream hydrology indicators at the time of observation, as well as geomorphic characteristics, and are subject to professional judgment. Stream features are located in the field using sub-meter capable GPS equipment. Riparian buffers adjacent to streams and rivers, consistent with the ANR Riparian Buffer Guidance, are designated for natural perennial and intermittent stream channels when applicable.

Two VHD streams cross the Study Area south of Route 78. During field investigation, one stream was found to consist of a wetland and is mapped as feature 2020-W4. The second VHD stream was observed in the field and mapped as intermittent stream 2020-S1 (see Natural Resources Map, Attachment 1). Stream 2020-S1 is an intermittent stream that flows towards the Missisquoi River and is associated with wetland 2020-3. As the stream is intermittent, a regulated River Corridor does not apply, though a 50-foot riparian buffer does, pursuant to the ANR Riparian Buffer Guidance. Further details characterizing the stream channel are provided in the Summary of Delineated Streams (Attachment 3).

The proposed Project will not impact the delineated intermittent stream and no tree clearing or ground disturbance is anticipated within the 50-foot riparian buffer. As such, there will be no adverse impacts to stream condition, nor will the Project endanger the health, safety, or welfare of the public or of adjoining landowners.



SHORELINES (§ 6086(a)(1)(F))

Shorelines are defined under Act 250, as also incorporated into Section 248, as the land adjacent to the waters of lakes, ponds, reservoirs, and rivers. Shorelines include the land between the mean high-water mark and the low-water mark of such waters (Argentine 2008). The Study Area was reviewed against these criteria to determine if it is located on any shoreline areas. There are no shorelines located with the Study Area and the Project will not have any undue adverse impacts on areas defined as shorelines.

WETLANDS (§ 6086(a)(1)(G))

The wetlands criterion under Act 250, as incorporated into Section 248, requires that the proposed project comply with the Vermont Wetland Rules ("VWR") (ANR 2020a). The VWR regulate significant wetlands (Class I and Class II wetlands) and their buffers. Impacts to Class III wetlands are not considered under Act 250 Criterion 1(G), but are generally reviewed under Section 248(b)(5) through the PUC's consideration of the potential for undue adverse impacts on the natural environment. Further, wetlands are regulated by the USACE under Section 404 of the Clean Water Act ("CWA"), as well as the related DEC CWA Section 401 Water Quality Certification ("WQC") review process.

Wetland delineations are made pursuant to applicable methodologies outlined in the *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region Routine Determination Method* (USACE 2011). Wetlands are identified in the field with pink flagging. Wetland functions and value presence and significance are evaluated based on the field notes and observations according to the VWR (ANR 2020). When present, wetland features are GPS-located using the same methods as streams.

VHB prepared a summary spreadsheet that details wetland characteristics relative to the criteria for classifying significant wetlands under the VWR, as well as VHB's proposed wetland classifications under the VWR (Wetland Summary Table, Attachment 3). VHB completed USACE Wetland Determination Data Forms for on-site wetlands where it collected data along the wetland and upland boundary (Attachment 4).

There are no wetlands within the Study Area mapped by the Vermont Significant Wetlands Inventory ("VSWI"). Based on the results of VHB's field delineation on May 8, 2020, there are six wetland features within the Study Area that VHB suggests would meet the USACE and/or the DEC jurisdictional criteria (described below). Three of the VHB-mapped wetlands are Class II under the VWR, and subject to 50-foot buffers. Three wetlands are Class III and regulated under Section 404 of the Clean Water Act (see Attachment 1). No potential vernal pools occur within the Study Area. VHB field reviewed and confirmed the wetland boundaries and classifications with the DEC Wetland Program (Brock Freyer) and USACE (Mike Adams) on September 25, 2020. As evident in the representative photographs, wetlands within the Study Area are partially disturbed from recreational ATV traffic.

The proposed Project is sited to avoid impacts to wetlands and wetland buffers to the extent possible by generally working within the existing substation footprint or away from wetlands and associated wetland buffers. Current design will require temporary impacts to wetland buffer within the existing cleared ROW immediately north of existing substation, to accommodate material staging during construction. The staging area within the buffer was selected to avoid tree clearing and VELCO will install construction mats, and ensure that the area can be re-vegetated and restored following construction. Erosion controls will also be installed on the downgradient side of any temporary impacts to prevent sedimentation within the adjacent wetland or undisturbed portions of the buffer. In addition, temporary impacts may also be required to access existing conduit to update the fiber optic cable that will service the proposed control building. Proposed temporary impacts are considered Allowed Uses (6.08 and 6.12) and



the Project will employ best management practices developed by the Vermont Wetlands Program for temporary work within wetlands and wetland buffers. In addition, and based on siting impacts outside of wetlands, VHB concludes that the work does not require permit coverage under Section 404 of the Clean Water Act as no permanent or temporary fill is proposed within waters of the U.S. The Project will comply with the Vermont Wetland Rules, will employ best management practices for activities within wetland buffers, and will avoid impacts to wetlands regulated under Section 404 of the Clean Water Act. As such, the Project will not result in any undue adverse impacts to wetlands.

WATER SUPPLY (10 V.S.A. § 6086(a)(2) and (3))

To satisfy this criterion, the Project must show there is sufficient water available for the reasonably foreseeable needs of the Project and that the Project will not cause an unreasonable burden on an existing water supply, if one is to be utilized. The Project will use minimal amounts of water during the construction phase for potential dust control and to support vegetative growth, if necessary. VELCO is reviewing the installation of a well to serve the new control building, which will be designed in accordance with the Vermont Water Supply Rule. VELCO will follow pertinent regulations for the design, installation, and operation of a new onsite water supply well. The well will serve a single bathroom within the proposed new control building, which is not staffed and only used on a limited basis, such as but not limited to during monthly substation inspections by maintenance personnel.

As the system will be designed in accordance with regulatory standards, and the water supply will meet the limited needs of the new control building, the Project will have no undue adverse impacts on water supplies.

SOIL EROSION (10 V.S.A. § 6086(a)(4))

In order to satisfy this criterion, a project must not cause unreasonable soil erosion or significant drainage or runoff problems (Argentine 2008). Determination of compliance under this criterion involves two components: (1) preventing soil erosion, and (2) preventing a reduction in the land’s capacity to hold water.

Using available Vermont Center for Geographic Information (“VCGI”) data and soil description from the Natural Resource Conservation Service (“NRCS”), the following soils are mapped within the Study Area:

Soil Map Unit	Erodibility Ranking	Area (acres)
Enosburg loamy fine sand, 0 to 3 percent slopes	not highly erodible	0.01
Farmington loam, very rocky, 8 to 15 percent slopes	highly erodible	11.0
Lordstown loam, rocky, 8 to 15 percent slopes	potentially highly erodible	0.25
Raynham silt loam, 3 to 8 percent slopes	potentially highly erodible	21.5
Windsor loamy fine sand, 3 to 8 percent slopes	not highly erodible	18.1
Windsor loamy fine sand, 25 to 60 percent slopes	highly erodible	5.1

As the Project requires more than one acre of earth disturbance (approximately 2.6 acres), it will obtain a construction stormwater discharge permit from VT DEC’s Stormwater Section. The Project will comply with the VT DEC’s *Vermont Standards and Specifications for Erosion Prevention and Sediment Control* (2019), and *The Vermont Erosion Prevention*



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and *Sediment Control Field Guide* (2006). The implementation of these measures along with the applicable BMPs described in the VEGM will minimize the potential for sediment-laden runoff to leave the Project area. Examples of Erosion Prevention and Sediment Control (EPSC) measures to be implemented include: project demarcation "Limits of Disturbance" tape/fence along the perimeter of the Project site, silt fence and/or silt sock downgradient of soil disturbance as necessary, stabilized construction entrance/exit, and temporary and final stabilization of exposed soils through application of mulch or vegetative establishment. By implementing these EPSC measures, and obtaining a construction stormwater discharge permit if required, the Project will not have an undue adverse effect on soil erosion.

### RARE OR IRREPLACEABLE NATURAL AREAS (RINA) (§ 6086(a)(8)), AND NECESSARY WILDLIFE HABITAT AND ENDANGERED SPECIES (§6086(a)(8)(A))

From Act 250, as incorporated into Section 248 review, a project must be shown to have no undue adverse effect on Rare or Irreplaceable Natural Areas ("RINA") (§ 6086(a)(8)). Additionally, a project must not destroy or significantly endanger Necessary Wildlife Habitat ("NWH") or any Endangered Species (§ 6086(a)(8)(A)).

#### *RINA*

Certain significant natural communities may be deemed RINA under Act 250 Criterion 8. Determinations of "Significance" are made after utilizing a combination of community ranking, current condition (age, degree of disturbance), and landscape context (size, degree of fragmentation) in order to determine an "Element (or Community) Occurrence Ranking". Additional considerations for RINA include the presence of rare, threatened, or endangered ("RTE") species in these communities, as well as overall natural community associations.

In order to identify potential occurrences of known significant natural communities, VHB researched the Vermont Natural Heritage Inventory ("NHI") database for the presence of known Element Occurrences ("EOs") of significant natural community types within and adjacent to the Study Area. A one-mile radius was used when querying the NHI database (accessed Summer 2022) and information specific to each EO identified. During the field assessments, VHB field staff also reviewed the onsite natural community or vegetative assemblage types. Descriptions found in *Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont* (Thompson et. al 2019) were used to define the natural community parameters as well as characterize any natural communities within the Study Area. Field observations and mapping data were used to identify onsite natural communities.

Through database review, no known natural communities, significant or otherwise, are mapped within the Study Area. The EO search yielded one EO of an S3-ranked state-significant natural community (Silver Maple-Ostrich Fern Floodplain Forest) in the vicinity of the Study Area. Information gathered in the field is used to compile a list of onsite natural community or vegetative assemblage types and is included as Attachment 5. This methodology is used to characterize on-site community type and condition as well as identify any natural communities that might be considered RINA during Section 248 review. The results are also used to define habitat characteristics and identify any target habitats for rare or sensitive species as discussed below. From database and corroborative field review, it is VHB's judgment that there are no significant natural communities or other areas that could constitute a RINA within the Study Area.

#### *ENDANGERED SPECIES*



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Endangered Species include those that are defined as “threatened” or “endangered” on the Vermont state endangered and the state threatened species lists, and that are protected under the Vermont Endangered Species Rule. Those species protected under the federal Endangered Species Act are included as well. Rare, but otherwise not protected species are often included under this criterion as part of a Project’s potential impacts to the natural environments.

In order to identify the potential occurrence of rare or sensitive species, particularly those that are federal or Vermont-listed threatened or endangered<sup>1</sup>, and to quantify available onsite habitat condition relative to each, VHB researched the NHI database for the presence of known element occurrences (“EOs”) of RTE species within and adjacent to the Study Area. VHB used a one-mile radius to query for RTE species. The search yielded two plant EOs including one endangered plant species and one rare plant species. These consist of early thimbleweed (*Anemone multifida* var. *multifida*, S1/G5T5/E) and dotted horsemint (*Monarda punctata*, S1/G5). Several RTE animals were also identified through the EO query but are associated with the Missisquoi River and local streams. Based on NHI database review, there are no NHI-mapped RTE species within the Study Area. Details such as the species name, rarity rank and protection status, and potential habitat on site are included in Attachment 5, as well as any follow-up survey recommendations.

Additionally, VHB queried the U.S. Fish and Wildlife Service (“USFWS”) IPaC system project review database, to identify any federally listed Threatened or Endangered species or critical habitat within the Project region. The Project Study Area is within the known range of the forest-dwelling northern long-eared bat (*Myotis septentrionalis*) (“NLEB”), but USFWS-designated critical habitat is not located within the Study Area (see Attachment 6). From the NHI EOs, there are no known summer occurrences or hibernacula within 1 mile of the Study Area.

The Project activities are located within and immediately surrounding the existing substation and thus proposes no tree clearing and as such, per the *Regulatory Review Guidance for Protecting NLEB and Their Habitats* (FWD 2017c), no further conservation measures or presence/absence surveys are necessary.

During field efforts, VHB conducted a floristic inventory for RTE species on September 2, 2020 and September 9, 2022 (see Partial Floristic Inventory in Attachment 7). The survey identified the following RTE species: *Calystegia spithamea* (S2/T) and *Desmodium perplexum* (S2). The population of *Calystegia* was observed within the ROW south of VT Route 78 and away from Project activities. As such, the Project will entirely avoid and not result in any impacts to the population of *Calystegia spithamea*. Several occurrences of *Desmodium* were observed directly outside of the existing substation fence and within the associated drainage swales.

RTE occurrences were documented and captured using sub-meter capable GPS (see Attachment 1). RTE plant populations will be identified in the field using exclusion fence and flagging. Portions of the expanded portion of the existing access road will fall within 25-feet of mapped state rare *Desmodium* populations within the Study Area, but temporary fencing, and fencing associated with the existing substation will create a boundary to prevent inadvertent impacts and intrusions to mapped occurrences of *Desmodium*. VELCO sited the proposed Project to avoid impacts to RTE plant species.

As explained in the Site Description section above, the Study Area consists of cleared utility ROWs and forested areas with land adjacent to the Missisquoi River. From database and field reviews, it is VHB’s judgment that there are no

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<sup>1</sup> Federal-listed species are protected under the U.S. Endangered Species Act and Vermont-listed species are protected under 10 V.S.A. §123.



adverse effects on known listed threatened or endangered species resulting from the Project and that no RINA occurs within the Study Area.

#### *NECESSARY WILDLIFE HABITAT*

The types of habitats that typically constitute Necessary Wildlife Habitat ("NWH") include deer wintering habitat, black bear mast stands (concentrated American beech and oak species), black bear forested wetland habitat, black bear travel corridors, grassland bird habitat, or in some cases, moose overwintering area.

To review NWH, VHB researched available deer wintering area, black bear travel, and black bear feeding habitat mapping available from ANR to determine if the Study Area is situated within or adjacent to mapped NWH. Based on the results of a desktop review, the Project area does occur within a region of general bear habitat, but not within any areas previously mapped as any specific black bear forage or travel habitat. The closest ANR-mapped deer wintering area is approximately 2,500 feet east of the Project and no unmapped deer wintering areas occur within the Study Area. This database review was corroborated by inspection of on-site habitat, from which there is no NWH identified, including grassland bird habitat, within the Study Area and therefore, no impacts to NWH will occur.

#### PRIMARY AGRICULTURAL SOILS

VHB evaluated the Project pursuant to Primary Agricultural Soils ("PAS") as considered by the PUC and as defined under 10 V.S.A. § 6001(15). The site is currently largely wooded or developed for electric substation and transmission facilities and therefore not subject to agricultural use. The Project will not change the use of the site. However, approximately 39.84 acres of PAS occur within the Study Area. Soils within the Study Area consist of:

- Enosburg loamy fine sand, 0 to 3 percent slopes (Prime (b));
- Lordstown loam, rocky, 8 to 15 percent slopes (Statewide);
- Raynham silt loam, 3 to 8 percent slopes (Prime (b)); and
- Winsor loamy fine sand, 3 to 8 percent slopes (Statewide).

Work within NRCS-mapped PAS will be limited to minor re-alignment of the existing access road and substation fence, and impacts associated with a potential new potable water well and septic system. Approximately 16,000 sf (0.4-acre) of Enosburg loamy fine sand (Prime (b)) is anticipated to be impacted. VHB also understands that VELCO is exploring the areas along its existing driveway, within the existing transmission line corridor north of the substation and an area south of Route 78 as a laydown area to support the construction phase of the Project. To protect PAS during construction, VELCO will install 6" or more of stone atop fabric or timber mats to avoid impacts to PAS. Following construction, the stone on fabric and/or timber mats will be removed and the area will be allowed to re-vegetate. If needed, VELCO will perform additional restoration measures within these areas to ensure vegetative cover upon completion of the proposed project upgrades, including but not limited to the application of seed and mulch to restore the area.

As the majority of the work will be performed within the existing substation, and the *de minimis* nature of permanent impacts, it is VHB's judgment that the Project will not unduly impact PAS or the potential for the site to support agricultural activity.



**Attachments:**

1. Natural Resource Map
2. Representative Site Photographs
3. Wetland and Waters Summary Table
4. USACE Wetland Determination Data Forms
5. Potential Rare, Threatened, and Endangered Plant Species and Significant Natural Communities Summary in the Project Region and Onsite Habitats
6. USFWS IPaC Official Species List – Franklin County, VT
7. Plant Species Checklist

**References**

- Argentine, C.C. 2008. *Vermont Act 250 Handbook*. Putney Press, Brattleboro, VT.
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- Thompson, E.S., E. Sorenson, R.J. Zaino. 2019. *Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont*. Published by The Nature Conservancy and Vermont Department of Fish and Wildlife, distributed by University Press of New England.
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- USACE. 2011. *Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northcentral and Northeast Region (Version 2.0)*, ed. J.S. Wakeley, R.W. Lichvar, C.V. Noble, and J.F. Berkowitz. ERDC/EL TR-09-19. Vicksburg, MS: U.S. Army Engineer Research and Development Center.
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- USDA Web Soil Survey. 2022. Accessed online at: <http://websoilsurvey.nrcs.usda.gov/app/HomePage.htm>.
- Vermont Agency of Natural Resources. 2020a. Vermont Wetland Rules. Effective January 21, 2020. Available online at: [https://dec.vermont.gov/sites/dec/files/documents/wsmd\\_VermontWetlandRules.pdf](https://dec.vermont.gov/sites/dec/files/documents/wsmd_VermontWetlandRules.pdf)
- \_\_\_\_\_. 2020b. *The Low Risk Site Handbook for Erosion Prevention and Soil Control*. Department of Environmental Conservation.



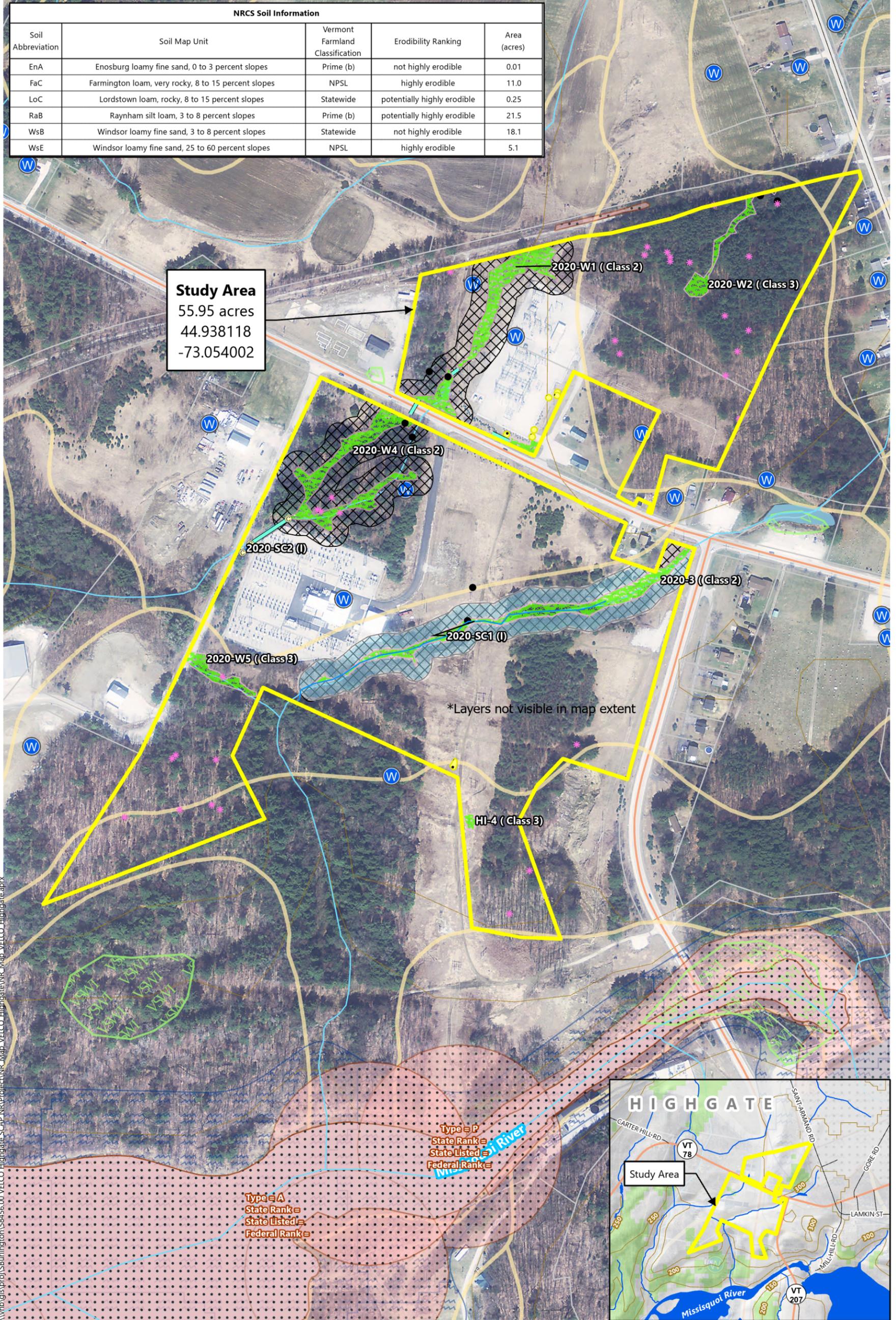
## Memorandum

- \_\_\_\_\_ 2018. *Rare and Uncommon Native Vascular Plants of Vermont*. Fish and Wildlife Department. Effective August 9, 2018.
- \_\_\_\_\_ 2017a. Vermont Water Quality Standards, Environmental Protection Rule Chapter 29A, Effective January 15, 2017.
- \_\_\_\_\_ 2017b. *Flood Hazard Area and River Corridor Protection Procedure*. Environmental Protection Rule Chapter 29. Department of Environmental Conservation. Effective September 7, 2017.
- \_\_\_\_\_ 2017c. *Regulatory Review Guidance for Protecting Northern Long-eared Bats and Their Habitats*. Effective February 2017.
- \_\_\_\_\_ 2016. *Vermont Natural Community Ranking Specifications*. Fish and Wildlife Department. Effective January 2016.
- \_\_\_\_\_ 2005. *Guidance for Agency Act 250 and Section 248 Comments Regarding Riparian Buffers*. December 9, 2005. Available online at: <http://www.anr.state.vt.us/site/html/buff/BufferGuidanceFINAL-120905.pdf>.

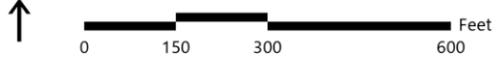
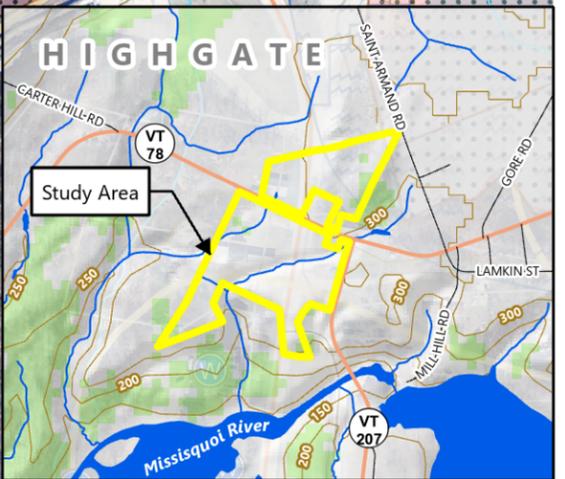
# ATTACHMENT 1

NRCS Soil Information				
Soil Abbreviation	Soil Map Unit	Vermont Farmland Classification	Erodibility Ranking	Area (acres)
EnA	Enosburg loamy fine sand, 0 to 3 percent slopes	Prime (b)	not highly erodible	0.01
FaC	Farmington loam, very rocky, 8 to 15 percent slopes	NPSL	highly erodible	11.0
LoC	Lordstown loam, rocky, 8 to 15 percent slopes	Statewide	potentially highly erodible	0.25
RaB	Raynham silt loam, 3 to 8 percent slopes	Prime (b)	potentially highly erodible	21.5
WsB	Windsor loamy fine sand, 3 to 8 percent slopes	Statewide	not highly erodible	18.1
WsE	Windsor loamy fine sand, 25 to 60 percent slopes	NPSL	highly erodible	5.1

**Study Area**  
55.95 acres  
44.938118  
-73.054002



\\vhb\gis\proj\58456.00 VELCO Highgate SCAP NR\Project\NR\_Map\_VELCO\_Highgate\NR\_Map\_VELCO\_Highgate.aprx



**Highgate Substation | Highgate, Vermont**

- Study Area (VHB)
- Delineated Wetland (Class) (VHB)
- Class II 50' Wetland Buffer (VHB)
- Delineation Data Point (VHB)
- Delineated Stream (VHB)
- Proposed 50' Riparian Stream Buffer (VHB)
- RTE Plant Area (VHB)
- Potential Roost Tree (VHB)
- Found Culvert (VHB)
- Culvert Point (VHB)
- Public or Private Well (ANR)
- VSWI Wetland (ANR)
- Deer Wintering Area (ANR)\*
- NHI Uncommon Occurrence (FWD)\*\*
- River Corridor (ANR)\*
- VHD Stream (VCGI)
- VHD Waterbody (VCGI)
- FEMA Zone A (VHB/FEMA)
- Ground Water Protection Area (ANR)\*
- Surface Water Protection Area (ANR)\*
- NRCS Soil Boundary (VCGI)
- Parcel Boundary (VCGI)
- Town Boundary (VCGI)
- County Boundary (VCGI)\*
- Interstate\*
- US Highway
- State Highway\*
- Town Road
- 50' Contours (VCGI)

**Natural Resources Map**  
Wetlands/Waters surveys conducted by VHB (R. Scott) on May 8, 2020. Rare plant survey conducted by VHB (C. Fenner) on September 2, 2020. Reviewed by ANR District Ecologist on September 25, 2020.  
Sources:  
Background Imagery by VCGI (Collected in 2016)  
VCGI (Vermont Center for Geographic Information - Various Dates)  
ANR (Vermont Agency of Natural Resources - Various Dates)  
FWD (Vermont Fish and Wildlife Department - 2018)  
VHB (2020)

\*Layers not visible in map extent

## ATTACHMENT 2



# SCAP Highgate 2020 Field Assessment Representative Site Photographs

PROJECT NUMBER

58456.00

VELCO

VELCO Highgate Substation, U.S. Route 78, Highgate,  
Vermont



NO. 1

DESCRIPTION

View to the east of palustrine emergent portion of Wetland 2020-W1, along Route 78.



NO. 2

DESCRIPTION

View of southern portion of wetland 2020-W2 showing disturbance from ATV use.



NO. 3

DESCRIPTION

View to the west of at palustrine emergent wetland 2020-W3.



NO. 4

DESCRIPTION

Representative view of wetland 2020-W3.



NO. 5

DESCRIPTION

View looking northeast of palustrine emergent/palustrine forested portion of Wetland 2020-W4.



NO. 6

DESCRIPTION

View looking west of wetland 2020-W5.



NO. 7

DESCRIPTION

View looking northeast of stream 202-SC1, downgradient of wetland 2020-W3.



NO. 8

DESCRIPTION

View looking northeast of stream 202-SC1 within wetland 2020-W3.



NO. 9

DESCRIPTION

Representative view looking east  
of Stream 2020-SC-2.

## ATTACHMENT 3

**Summary of Delineated Wetlands and Streams**

**Project:** SCAP Highgate

**Client:** VELCO

**Prepared by:** VHB (R. Scott) July 29, 2022

**Delineation Date(s):** VHB (R. Scott/J. Smith) May 8 and 15, 2020.



VHB Delineated Wetlands										
Wetland ID	Delineated Area (Square Feet) <sup>1</sup>	Cowardin Classification <sup>2</sup>	Vermont Wetland Rules Classification					Typical Vegetation	Comments	
			Contiguous to a VSWI-mapped Wetland?	Riparian Wetland Contiguous to Stream Channel? (Flow Regime) <sup>3</sup>	VWR Section 4.6 Presumptions <sup>4</sup>	VWR Section 5 Functional Criteria Presence / Significance				VHB-Proposed VWR Classification <sup>6</sup>
						Type <sup>5</sup>	VHB-Proposed Significant?			
2020-W1	36,648	PEM,PSS,PFO	No	No	a	5.1 (L), 5.2 (L)	No	II	<i>Phragmites australis, Onoclea sensibilis</i>	Wetland within maintained ROW and adjacent to existing substation. Connected to Wetland 2020-W4 via culvert beneath Route 78.
2020-W2	9,790	PEM,PFO	No	No	-	5.1 (L), 5.2 (L)	No	III	<i>Onoclea sensibilis, Fraxinus pennsylvanica</i>	Disconnected feature in forested portion of Study Area. Northern portion located adjacent to former railroad bed.
2020-W3	36,825	PEM,PSS	No	Yes	b,c	5.1 (L), 5.2 (L), 5.10 (L)	No	II	<i>Alnus incanra, Onoclea sensibilis, Phalaris arundinacea</i>	Fringe wetland system associated with Stream 2020-SC-1
2020-W4	33,804	PEM	No	No	a	5.1 (L), 5.2 (L)	No	II	<i>Onoclea sensibilis, Osmundastrum cinnamomeum</i>	Wetland within forested portion of the Study Area. Connected to Wetland 2020-W1 via a culvert and drains to a stream on the west side of the converter station
2020-W5	8,443	PEM	No	No	-	5.1 (L), 5.2 (L)	No	III	<i>Onoclea sensibilis, Osmundastrum cinnamomeum</i>	Disconnected feature without a connection to downgradient Stream 2020-SC-1
HI-4	1,506	PEM	No	No	-	5.1 (L), 5.2 (L)	No	III	<i>Onoclea sensibilis</i>	Previously delineated and confirmed by VHB in 2020. Disconnected feature within maintained utility ROW.

<sup>1</sup>All wetlands field-delineated per the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Northeast and North Central Region. U.S. Army Corps of Engineers. 2011;

<sup>2</sup>Classification follows Cowardin, L.M., Carter, V., Golet, F.C. and E.T. LaRoe. 1979. Classification of Wetlands and Deepwater Habitat of the United States. U.S. Fish and Wildlife Service. FWS/OBD-79/31. 103pp.

<sup>3</sup>Wetland contiguity to streams as defined in the Vermont ANR 12/9/05 *Guidance for Agency Act 250 and Section 248 Comments Regarding Riparian Buffers* and confirmed if a delineated perennial or intermittent stream channel inflows, through flows, and outflows from a delineated wetland (ephemeral channels not typically being subject to ANR Riparian Buffer Guidance). The vegetative assemblage or natural community type is used when determining riparian vegetation function. Flow regime determined based on qualitative observations of instream hydrology indicators and geomorphic characteristic and are subject to professional judgment (P=perennial, I=intermittent, E=ephemeral).

<sup>4</sup>Alpha-numeric codes correspond with Section 4.6 Presumptions of the 2020 Vermont Wetland Rules.

<sup>5</sup>VWR Section 5: Functional Criteria for Evaluating a Wetland's Significance: 5.1=Water Storage for Flood Water and Storm Runoff, 5.2=Surface and Groundwater Protection, 5.3=Fish Habitat, 5.4=Wildlife Habitat, 5.5=Exemplary Wetland Natural Community, 5.6=Rare, Threatened or Endangered Species Habitat, 5.7=Education and Research in Natural Sciences, 5.8=Recreational Value and Economic Benefits, 5.9=Open Space and Aesthetics, 5.10=Erosion Control Through Binding and Stabilizing the Soil. (P)= Present, (H)=High, (L)=Low; Correspond to observed level of functionality.

<sup>6</sup>VHB-Proposed VWR Classification is based on review and application of the VWR. Wetland boundaries and classifications reviewed and confirmed by ANR-DEC during a site visit on September 25, 2020.

VHB Delineated Streams											
Stream ID	Stream Name	Associated Wetlands	Average Ordinary High Water (OHW) Width (Feet) <sup>1</sup>	Dominant Substrate	Water Depth (Inches)	Bank Height (Feet)	Flow Regime (Ephemeral, Intermittent, or Perennial) <sup>2</sup>	ANR-Mapped River Corridor? (Yes/No)	Watershed Size (Square Miles) <sup>3</sup>	VWQS Classification (2014) <sup>4</sup>	Comments
2020-SC-1	n/a	2020-W3	2.0	Organic, Cobble, Bedrock	3	1.0	Intermittent	No	0.1	B	Intermittent tributary to the Missisquoi River.

<sup>1</sup>U.S. Army Corps of Engineers (USACE). 2005. "Regulatory Guidance Letter. Subject: Ordinary High Water Mark Identification." No. 05-05.

<sup>2</sup>Stream flow regime determined based on qualitative observations of in stream hydrology indicators and geomorphic characteristic and are subject to professional judgment.

<sup>3</sup>Watershed size determined from Vermont ANR Stream Alteration Regulatory Program mapping.

<sup>4</sup>From the Vermont Water Quality Standards (Vt. Code R 12 004 052), Updated 2017 [Vermont Agency of Natural Resources (ANR) 2016].

<sup>5</sup>List of streams from the State of Vermont 2016 303(d) Assessment of the Condition of Vermont Waters. Priority Listing of Vermont Waters. <http://dec.vermont.gov/watershed/map/assessment#Assessment> (Vermont Department of Environmental Conservation (VT DEC) – Watershed Management Division, 2016) .

<sup>6</sup>If no ANR mapped river corridor is present, VHB proposed river corridor is applied pursuant to the DEC Flood Hazard Area and River Corridor Protection Procedure, updated 2017, as applicable.

## ATTACHMENT 4



WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

2020-W1-Wet

Project Site: SCAP Highgate City/County: Highgate/Franklin Smp. Date: 5/15/2020
Applicant/Owner: VELCO State: Vermont Sampling Point: 2020-W1-Wet
Investigator(s): RMS/JWS Section, Township, Range:
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 3 to 8
Subregion (LRR or MLRA): LRR R Lat: Long: Datum: NAD 83
Soil Map Unit: Raynham silt loam NWI Class: PEM/PSS
Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? No Normal Circumstances? Yes
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? YES
Hydric Soil Present? YES
Wetland Hydrology Present? YES
Is This Sample Area Within a Wetland? YES
Remarks: Maintained utility ROW

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) X Water-Stained Leaves (B9)
High Water Table (A2) Aquatic Fauna (B13)
Saturation (A3) Marl Deposits (B13)
Water Marks (B1) Hydrogen Sulfide Odor (C1)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3)
Drift Deposits (B3) Presence of Reduced Iron (C4)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6)
Iron Deposits (B5) Thin Muck Surface (C7)
Inundation Visible on Aerial (B7) Other (Explain in Remarks)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Depth (inches):
Water Table Present? Depth (inches):
Saturation Present? X Depth (inches): Surface
Wetland Hydrology Present? YES

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
0.03" of rain in 7 days prior in Highgate, VT (NWS 2018); PDSI 1.70 (Near Normal) for week ending 5/16/2020

Remarks:

SOIL

Table with 8 columns: Depth, Matrix, Color (moist), %, Redox Features (Color, %, Type, Loc), Texture, Remarks. Row 1: 0-16+, 10 YR 2/1, 100, MUCK.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. 2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:
X Histosol (A1) Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
Histic Epipedon (A2)
Black Histic (A3) Thin Dark Surface (S9) (LRR R, MLRA 149B)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) (LRR K, L)
Stratified Layers (A5) Loamy Gleyed Matrix (F2)
Depleted Below Dark Surface (A11) Depleted Matrix (F3)
Thick Dark Surface (A12) Redox Dark Surface (F6)
Sandy Mucky Mineral (S1) Depleted Dark Surface (F7)
Sandy Gleyed Matrix (S4) Redox Depressions (F8)
Sandy Redox (S5)
Stripped Matrix (S6)
Dark Surface (S7) (LRR R, MLRA 149B)
Indicators for Problematic Hydric Soils3:
2 cm Muck (A10) (LRR K, L, MLRA 149B)
Coast Prairie Redox (A16) (LRR K, L, R)
5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
Dark Surface (S9) (LRR K, L, M)
Polyvalue Below Surface (S8) (LRR K, L)
Thin Dark Surface (S9) (LRR K, L)
Iron-Manganese Masses (F12) (LRR K, L, R)
Piedmont Floodplain Soils (F19) (MLRA 149B)
Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
Red Parent Material (F21)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

Restrictive Layer (if observed):
Type:
Depth (inches):
Hydric Soil Present? YES

Remarks:



Tree Stratum	(Plot size: <u>30' RAD</u> )	Absolute % Cover	Dom. Sp?	Indicator Status	
1.					Dominance Test Worksheet: # Dominants OBL, FACW, FAC: <u>4</u> (A)  # Dominants across all strata: <u>5</u> (B)  % Dominants OBL, FACW, FAC: <u>80%</u> (A/B)
2.					
3.					
4.					
5.					
6.					
7.					
		= Total Cover			Prevalence Index Worksheet: Total % Cover of:                      Multiply By: OBL <u>10.5</u> x 1 = <u>10.5</u> FACW <u>99.5</u> x 2 = <u>199</u> FAC <u>48.5</u> x 3 = <u>145.5</u> FACU <u>3</u> x 4 = <u>12</u> UPL _____                                    x 5 = _____ Sum: <u>161.5</u> (A) <u>367</u> (B)  Prevalence Index = B/A = <u>2.27</u>
Sapling Stratum (Plot size: <u>15' RAD</u> )					
1.	<b>Populus tremuloides</b>	<b>3</b>	<b>X</b>	<b>FACU</b>	
2.					
3.					
4.					
5.					
6.					
7.					
		<u>3</u> = Total Cover			
Shrub Stratum (Plot size: <u>15' RAD</u> )					Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is > 50% <input checked="" type="checkbox"/> Prevalence Index is <= 3.0 _____ Problematic Hydrophytic Vegetation <sup>1</sup> (explain) _____ Rapid Test for Hydrophytic Vegetation _____ Morphological Adaptations  <small><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</small>
1.	<b>Alnus incana</b>	<b>20.5</b>	<b>X</b>	<b>FACW</b>	
2.	<b>Spiraea tomentosa</b>	<b>20.5</b>	<b>X</b>	<b>FACW</b>	
3.					
4.					
5.					
6.					
7.					
		<u>41</u> = Total Cover			
Herb Stratum (Plot size: <u>5' RAD</u> )					Definitions of Vegetation Strata:  Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).  Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.  Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.  Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.  Woody vine - All woody vines, regardless of height.
1.	<b>Solidago rugosa</b>	<b>38</b>	<b>X</b>	<b>FAC</b>	
2.	<b>Phragmites australis</b>	<b>38</b>	<b>X</b>	<b>FACW</b>	
3.	<b>Onoclea sensibilis</b>	<b>20.5</b>		<b>FACW</b>	
4.	<b>Equisetum arvense</b>	<b>10.5</b>		<b>FAC</b>	
5.	<b>Typha latifolia</b>	<b>10.5</b>		<b>OBL</b>	
6.					
7.					
8.					
9.					
10.					
11.					
12.					
		<u>117.5</u> = Total Cover			
Woody Vines (Plot size: <u>15' RAD</u> )					Hydrophytic Vegetation Present? <u>YES</u>
1.					
2.					
3.					
4.					
5.					
		= Total Cover			
Remarks: (If observed, list morphological adaptations below).					



WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

2020-W1-Up

Project Site: SCAP Highgate City/County: Highgate/Franklin Samp. Date: 5/15/2020
Applicant/Owner: VELCO State: Vermont Sampling Point: 2020-W1-Up
Investigator(s): RMS/JWS Section, Township, Range:
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 3 to 8
Subregion (LRR or MLRA): LRR R Lat: Long: Datum: NAD 83
Soil Map Unit: Raynham silt loam NWI Class:
Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? No Normal Circumstances? Yes
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? NO
Hydric Soil Present? NO
Wetland Hydrology Present? NO
Is This Sample Area Within a Wetland? NO
Remarks: Maintained utility ROW

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9) Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10)
Saturation (A3) Marl Deposits (B13) Moss Trim Lines (B16)
Water Marks (B1) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Crayfish Burrows (C8)
Drift Deposits (B3) Presence of Reduced Iron (C4) Saturation Visible on Aerial (C9)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Stunted or Stressed Plants (D1)
Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2)
Inundation Visible on Aerial (B7) Other (Explain in Remarks) Shallow Aquitard (D3)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5) Microtopographic Relief (D4)

Field Observations:
Surface Water Present? Depth (inches):
Water Table Present? Depth (inches): Wetland Hydrology Present? NO
Saturation Present? Depth (inches):

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
0.03" of rain in 7 days prior in Highgate, VT (NWS 2018); PDSI 1.70 (Near Normal) for week ending 5/16/2020

Remarks:

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)
Table with columns: Depth, Matrix, Redox Features, Type, Loc, Texture, Remarks.
0-8 10 YR 5/6 100 10 YR 6/8 2 M SANDY LOAM
8-16+ 10 YR 5/3 98 10 YR 6/8 2 M SANDY LOAM

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. 2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:
Histosol (A1) Polyvalue Below Surface (S8) (LRR R, MLRA 149B) 2 cm Muck (A10) (LRR K, L, MLRA 149B)
Histic Epipedon (A2) MLRA 149B) Coast Prairie Redox (A16) (LRR K, L, R)
Black Histic (A3) Thin Dark Surface (S9) (LRR R, MLRA 149B) 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) (LRR K, L) Dark Surface (S9) (LRR K, L, M)
Stratified Layers (A5) Loamy Gleyed Matrix (F2) Polyvalue Below Surface (S8) (LRR K, L)
Depleted Below Dark Surface (A11) Depleted Matrix (F3) Thin Dark Surface (S9) (LRR K, L)
Thick Dark Surface (A12) Redox Dark Surface (F6) Iron-Manganese Masses (F12) (LRR K, L, R)
Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) Piedmont Floodplain Soils (F19) (MLRA 149B)
Sandy Gleyed Matrix (S4) Redox Depressions (F8) Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
Sandy Redox (S5) Red Parent Material (F21)
Stripped Matrix (S6) 3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Very Shallow Dark Surface (TF12)
Dark Surface (S7) (LRR R, MLRA 149B) Other (Explain in Remarks)

Restrictive Layer (if observed):
Type:
Depth (inches):
Hydric Soil Present? NO
Northcentral and Northeast Region - Version 2.0

	Absolute % Cover	Dom. Sp?	Indicator Status	
<b>Tree Stratum</b> (Plot size: <u>30' RAD</u> )				Dominance Test Worksheet: # Dominants OBL, FACW, FAC: <u>2</u> (A)  # Dominants across all strata: <u>6</u> (B)  % Dominants OBL, FACW, FAC: <u>33%</u> (A/B)
1. <u>Pinus strobus</u>	<u>63</u>	<u>X</u>	<u>FACU</u>	
2. <u>Tsuga canadensis</u>	<u>38</u>	<u>X</u>	<u>FACU</u>	
3. <u>Betula populifolia</u>	<u>10.5</u>		<u>FAC</u>	
4. <u>Pinus resinosa</u>	<u>10.5</u>		<u>FACU</u>	
5. _____				
6. _____				
<u>122</u> = Total Cover				
<b>Sapling Stratum</b> (Plot size: <u>15' RAD</u> )				Prevalence Index Worksheet: Total % Cover of: _____ Multiply By: _____ OBL _____ x 1 = _____ FACW _____ x 2 = _____ FAC <u>24</u> x 3 = <u>72</u> FACU <u>135</u> x 4 = <u>540</u> UPL _____ x 5 = _____ Sum: <u>159</u> (A) <u>612</u> (B)  Prevalence Index = B/A = <u>3.85</u>
1. <u>Tsuga canadensis</u>	<u>20.5</u>	<u>X</u>	<u>FACU</u>	
2. <u>Acer rubrum</u>	<u>10.5</u>	<u>X</u>	<u>FAC</u>	
3. _____				
4. _____				
5. _____				
6. _____				
<u>31</u> = Total Cover				
<b>Shrub Stratum</b> (Plot size: <u>15' RAD</u> )				Hydrophytic Vegetation Indicators: _____ Dominance Test is > 50% _____ Prevalence Index is <= 3.0 _____ Problematic Hydrophytic Vegetation <sup>1</sup> (explain) _____ Rapid Test for Hydrophytic Vegetation _____ Morphological Adaptations  <small><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</small>
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
6. _____				
_____ = Total Cover				
<b>Herb Stratum</b> (Plot size: <u>5' RAD</u> )				Definitions of Vegetation Strata:  <b>Tree</b> - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).  <b>Sapling</b> - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.  <b>Shrub</b> - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.  <b>Herb</b> - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.  <b>Woody vine</b> - All woody vines, regardless of height.
1. <u>Fragaria virginiana</u>	<u>3</u>	<u>X</u>	<u>FACU</u>	
2. <u>Solidago rugosa</u>	<u>3</u>	<u>X</u>	<u>FAC</u>	
3. _____				
4. _____				
5. _____				
6. _____				
7. _____				
8. _____				
9. _____				
10. _____				
11. _____				
12. _____				
<u>6</u> = Total Cover				
<b>Woody Vines</b> (Plot size: <u>15' RAD</u> )				Hydrophytic Vegetation Present? <u>NO</u>
1. _____				
2. _____				
3. _____				
4. _____				
5. _____				
_____ = Total Cover				

Remarks: (If observed, list morphological adaptations below).



WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

2020-W2-Wet

Project Site: SCAP Highgate City/County: Highgate/Franklin Smp. Date: 5/15/2020
Applicant/Owner: VELCO State: Vermont Sampling Point: 2020-W2-Wet
Investigator(s): RMS/JWS Section, Township, Range:
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 8 to 15
Subregion (LRR or MLRA): LRR R Lat: Long: Datum: NAD 83
Soil Map Unit: Farmington loam NWI Class: PEM/PFO
Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? No Normal Circumstances? Yes
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? YES
Hydric Soil Present? YES
Wetland Hydrology Present? YES
Is This Sample Area Within a Wetland? YES
Remarks: Forested

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Field Observations: Surface Water Present? Depth (inches):
Water Table Present? Depth (inches):
Saturation Present? Depth (inches):
Wetland Hydrology Present? YES
Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
0.03" of rain in 7 days prior in Highgate, VT (NWS 2018); PDSI 1.70 (Near Normal) for week ending 5/16/2020
Remarks:

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)
Depth Matrix Redox Features Texture Remarks
0-6 10 YR 2/1 100 Color (moist) % Type1 Loc2 SANDY LOAM
6-16+ 10 YR 6/1 95 10 YR 5/6 5 F M SANDY LOAM
Hydric Soil Indicators: Histosol (A1) Polyvalue Below Surface (S8) (LRR R, MLRA 149B) 2 cm Muck (A10) (LRR K, L, MLRA 149B)
Histic Epipedon (A2) MLRA 149B) Coast Prairie Redox (A16) (LRR K, L, R)
Black Histic (A3) Thin Dark Surface (S9) (LRR R, MLRA 149B) 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) (LRR K, L) Dark Surface (S9) (LRR K, L, M)
Stratified Layers (A5) Loamy Gleyed Matrix (F2) Polyvalue Below Surface (S8) (LRR K, L)
Depleted Below Dark Surface (A11) X Depleted Matrix (F3) Thin Dark Surface (S9) (LRR K, L)
Thick Dark Surface (A12) Redox Dark Surface (F6) Iron-Manganese Masses (F12) (LRR K, L, R)
Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) Piedmont Floodplain Soils (F19) (MLRA 149B)
Sandy Gleyed Matrix (S4) Redox Depressions (F8) Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
Sandy Redox (S5) Red Parent Material (F21)
Stripped Matrix (S6) Very Shallow Dark Surface (TF12)
Dark Surface (S7) (LRR R, MLRA 149B) Other (Explain in Remarks)
Restrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? YES
Remarks:





WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

2020-W2-Up

Project Site: SCAP Highgate City/County: Highgate/Franklin Smp. Date: 5/15/2020
Applicant/Owner: VELCO State: Vermont Sampling Point: 2020-W2-Up
Investigator(s): RMS/JWS Section, Township, Range:
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 8 to 15
Subregion (LRR or MLRA): LRR R Lat: Long: Datum: NAD 83
Soil Map Unit: Farmington loam NWI Class:
Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? No Normal Circumstances? Yes
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? NO
Hydric Soil Present? NO
Wetland Hydrology Present? NO
Is This Sample Area Within a Wetland? NO
Remarks: Forested

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9) Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10)
Saturation (A3) Marl Deposits (B13) Moss Trim Lines (B16)
Water Marks (B1) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Crayfish Burrows (C8)
Drift Deposits (B3) Presence of Reduced Iron (C4) Saturation Visible on Aerial (C9)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Stunted or Stressed Plants (D1)
Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2)
Inundation Visible on Aerial (B7) Other (Explain in Remarks) Shallow Aquitard (D3)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5) Microtopographic Relief (D4)

Field Observations:
Surface Water Present? Depth (inches):
Water Table Present? Depth (inches):
Saturation Present? Depth (inches):
Wetland Hydrology Present? NO

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
0.03" of rain in 7 days prior in Highgate, VT (NWS 2018); PDSI 1.70 (Near Normal) for week ending 5/16/2020

Remarks:

SOIL

Table with 8 columns: Depth, Matrix, Color (moist), %, Redox Features (Color, %, Type, Loc), Texture, Remarks. Rows include 0-4, 4-8, and 8-14 depth intervals with soil characteristics like SANDY LOAM.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. 2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: Histosol (A1) Polyvalue Below Surface (S8) (LRR R, MLRA 149B) 2 cm Muck (A10) (LRR K, L, MLRA 149B)
Histic Epipedon (A2) MLRA 149B) Coast Prairie Redox (A16) (LRR K, L, R)
Black Histic (A3) Thin Dark Surface (S9) (LRR R, MLRA 149B) 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) (LRR K, L) Dark Surface (S9) (LRR K, L, M)
Stratified Layers (A5) Loamy Gleyed Matrix (F2) Polyvalue Below Surface (S8) (LRR K, L)
Depleted Below Dark Surface (A11) Depleted Matrix (F3) Thin Dark Surface (S9) (LRR K, L)
Thick Dark Surface (A12) Redox Dark Surface (F6) Iron-Manganese Masses (F12) (LRR K, L, R)
Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) Piedmont Floodplain Soils (F19) (MLRA 149B)
Sandy Gleyed Matrix (S4) Redox Depressions (F8) Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
Sandy Redox (S5) Red Parent Material (F21)
Stripped Matrix (S6) 3Indicators of hydrophytic vegetation and Very Shallow Dark Surface (TF12)
Dark Surface (S7) (LRR R, MLRA 149B) wetland hydrology must be present, unless Other (Explain in Remarks)
disturbed or problematic.

Restrictive Layer (if observed):
Type: Rock
Depth (inches): 14
Hydric Soil Present? NO

Remarks:

	Absolute % Cover	Dom. Sp?	Indicator Status		
<b>Tree Stratum</b> (Plot size: <u>30' RAD</u> )					
1. <b>Pinus strobus</b>	<b>38</b>	<b>X</b>	<b>FACU</b>	<b>Dominance Test Worksheet:</b> # Dominants OBL, FACW, FAC: <u>1</u> (A) # Dominants across all strata: <u>3</u> (B) % Dominants OBL, FACW, FAC: <u>33%</u> (A/B)	
2. <b>Tsuga canadensis</b>	<b>38</b>	<b>X</b>	<b>FACU</b>		
3. <b>Acer rubrum</b>	<b>20.5</b>	<b>X</b>	<b>FAC</b>		
4. _____					
5. _____					
6. _____					
7. _____					
	<b>96.5</b>	= Total Cover		<b>Prevalence Index Worksheet:</b> Total % Cover of: _____ Multiply By: _____ OBL _____ x 1 = _____ FACW _____ x 2 = _____ FAC <b>20.5</b> x 3 = <b>61.5</b> FACU <b>76</b> x 4 = <b>304</b> UPL _____ x 5 = _____ Sum: <b>96.5</b> (A) <b>365.5</b> (B) Prevalence Index = B/A = <b>3.79</b>	
<b>Sapling Stratum</b> (Plot size: <u>15' RAD</u> )					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
		= Total Cover		<b>Hydrophytic Vegetation Indicators:</b> _____ Dominance Test is > 50% _____ Prevalence Index is <= 3.0 _____ Problematic Hydrophytic Vegetation <sup>1</sup> (explain) _____ Rapid Test for Hydrophytic Vegetation _____ Morphological Adaptations <small><sup>1</sup>Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.</small>	
<b>Shrub Stratum</b> (Plot size: <u>15' RAD</u> )					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
		= Total Cover		<b>Definitions of Vegetation Strata:</b>  <b>Tree</b> - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).  <b>Sapling</b> - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.  <b>Shrub</b> - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.  <b>Herb</b> - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.  <b>Woody vine</b> - All woody vines, regardless of height.	
<b>Herb Stratum</b> (Plot size: <u>5' RAD</u> )					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
6. _____					
7. _____					
8. _____					
9. _____					
10. _____					
11. _____					
12. _____					
		= Total Cover		<b>Hydrophytic Vegetation Present?</b> <u>NO</u>	
<b>Woody Vines</b> (Plot size: <u>15' RAD</u> )					
1. _____					
2. _____					
3. _____					
4. _____					
5. _____					
		= Total Cover			
Remarks: (If observed, list morphological adaptations below).					



WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

2020-W3-Wet

Project Site: SCAP Highgate City/County: Highgate/Franklin State: Vermont Sampling Point: 2020-W3-Wet
Applicant/Owner: VELCO
Investigator(s): RMS/JWS
Landform: Terrace Local relief: Concave Slope (%): 3 to 8
Subregion: LRR R Lat: Long: Datum: NAD 83
Soil Map Unit: Windsor loamy fine sand NWI Class: PEM/PSS
Are climatic/hydrologic conditions on the site typical for this time of year? Yes
Are Vegetation, Soil, or Hydrology significantly disturbed? No
Are Vegetation, Soil, or Hydrology naturally problematic? No

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? YES
Hydric Soil Present? YES
Wetland Hydrology Present? YES
Is This Sample Area Within a Wetland? YES
Remarks: Partially maintained ROW; Riparian system

HYDROLOGY

Wetland Hydrology Indicators: Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
X Surface Water (A1)
High Water Table (A2)
X Saturation (A3)
Water Marks (B1)
Sediment Deposits (B2)
Drift Deposits (B3)
Algal Mat or Crust (B4)
Iron Deposits (B5)
Inundation Visible on Aerial (B7)
Sparsely Vegetated Concave Surface (B8)
Water-Stained Leaves (B9)
Aquatic Fauna (B13)
Marl Deposits (B13)
Hydrogen Sulfide Odor (C1)
Oxidized Rhizospheres on Living Roots (C3)
X Presence of Reduced Iron (C4)
Recent Iron Reduction in Tilled Soils (C6)
Thin Muck Surface (C7)
Other (Explain in Remarks)
Surface Soil Cracks (B6)
Drainage Patterns (B10)
Moss Trim Lines (B16)
Dry-Season Water Table (C2)
Crayfish Burrows (C8)
Saturation Visible on Aerial (C9)
Stunted or Stressed Plants (D1)
Geomorphic Position (D2)
Shallow Aquitard (D3)
Microtopographic Relief (D4)
FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? X Depth (inches): 1
Water Table Present? X Depth (inches): 4
Saturation Present? X Depth (inches): Surface
Wetland Hydrology Present? YES

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
0.03" of rain in 7 days prior in Highgate, VT (NWS 2018); PDSI 1.70 (Near Normal) for week ending 5/16/2020

Remarks:

SOIL

Table with 9 columns: Depth, Matrix, Redox Features, Type, Loc, Texture, Remarks. Rows include 0-4 and 4-16+ depth intervals with matrix and redox data.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. 2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: Histosol (A1), Histic Epipedon (A2), Black Histic (A3), Hydrogen Sulfide (A4), Stratified Layers (A5), Depleted Below Dark Surface (A11), Thick Dark Surface (A12), Sandy Mucky Mineral (S1), Sandy Gleyed Matrix (S4), Sandy Redox (S5), Stripped Matrix (S6), Dark Surface (S7) (LRR R, MLRA 149B)
Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
Thin Dark Surface (S9) (LRR R, MLRA 149B)
Loamy Mucky Mineral (F1) (LRR K, L)
Loamy Gleyed Matrix (F2)
X Depleted Matrix (F3)
Redox Dark Surface (F6)
Depleted Dark Surface (F7)
Redox Depressions (F8)
Indicators for Problematic Hydric Soils3: 2 cm Muck (A10) (LRR K, L, MLRA 149B), Coast Prairie Redox (A16) (LRR K, L, R), 5 cm Mucky Peat or Peat (S3) (LRR K, L, R), Dark Surface (S9) (LRR K, L, M), Polyvalue Below Surface (S8) (LRR K, L), Thin Dark Surface (S9) (LRR K, L), Iron-Manganese Masses (F12) (LRR K, L, R), Piedmont Floodplain Soils (F19) (MLRA 149B), Mesic Spodic (TA6) (MLRA 144A, 145, 149B), Red Parent Material (F21), Very Shallow Dark Surface (TF12), Other (Explain in Remarks)

Restrictive Layer (if observed): Type: Depth (inches): Hydric Soil Present? YES Northcentral and Northeast Region - Version 2.0

Tree Stratum	(Plot size: <u>30' RAD</u> )	Absolute % Cover	Dom. Sp?	Indicator Status		
1.	_____	_____	_____	_____	Dominance Test Worksheet: # Dominants OBL, FACW, FAC: <u>1</u> (A)  # Dominants across all strata: <u>1</u> (B)  % Dominants OBL, FACW, FAC: <u>100%</u> (A/B)	
2.	_____	_____	_____	_____		
3.	_____	_____	_____	_____		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
6.	_____	_____	_____	_____		
7.	_____	_____	_____	_____		
				= Total Cover	Prevalence Index Worksheet: Total % Cover of: _____ Multiply By: _____ OBL <u>21</u> x 1 = <u>21</u> FACW <u>63</u> x 2 = <u>126</u> FAC <u>3</u> x 3 = <u>9</u> FACU _____ x 4 = _____ UPL _____ x 5 = _____ Sum: <u>87</u> (A) <u>156</u> (B)  Prevalence Index = B/A = <u>1.79</u>	
Sapling Stratum	(Plot size: <u>15' RAD</u> )	Absolute % Cover	Dom. Sp?	Indicator Status		
1.	_____	_____	_____	_____		
2.	_____	_____	_____	_____		
3.	_____	_____	_____	_____		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
6.	_____	_____	_____	_____		
7.	_____	_____	_____	_____		
				= Total Cover	Hydrophytic Vegetation Indicators: <input checked="" type="checkbox"/> Dominance Test is > 50% <input checked="" type="checkbox"/> Prevalence Index is <= 3.0 _____ Problematic Hydrophytic Vegetation <sup>1</sup> (explain) _____ Rapid Test for Hydrophytic Vegetation _____ Morphological Adaptations  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.	
Shrub Stratum	(Plot size: <u>15' RAD</u> )	Absolute % Cover	Dom. Sp?	Indicator Status		
1.	_____	_____	_____	_____		
2.	_____	_____	_____	_____		
3.	_____	_____	_____	_____		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
6.	_____	_____	_____	_____		
7.	_____	_____	_____	_____		
				= Total Cover	Definitions of Vegetation Strata:  Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).  Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.  Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.  Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.  Woody vine - All woody vines, regardless of height.	
Herb Stratum	(Plot size: <u>5' RAD</u> )	Absolute % Cover	Dom. Sp?	Indicator Status		
1.	<b>Phalaris arundinacea</b>	<b>63</b>	<b>X</b>	<b>FACW</b>		
2.	<b>Typha latifolia</b>	<b>10.5</b>		<b>OBL</b>		
3.	<b>Carex stricta</b>	<b>10.5</b>		<b>OBL</b>		
4.	<b>Equisetum arvense</b>	<b>3</b>		<b>FAC</b>		
5.	_____	_____	_____	_____		
6.	_____	_____	_____	_____		
7.	_____	_____	_____	_____		
8.	_____	_____	_____	_____		
9.	_____	_____	_____	_____		
10.	_____	_____	_____	_____		
11.	_____	_____	_____	_____		
12.	_____	_____	_____	_____		
				<b>87</b> = Total Cover		
Woody Vines	(Plot size: <u>15' RAD</u> )	Absolute % Cover	Dom. Sp?	Indicator Status		
1.	_____	_____	_____	_____		
2.	_____	_____	_____	_____		
3.	_____	_____	_____	_____		
4.	_____	_____	_____	_____		
5.	_____	_____	_____	_____		
				= Total Cover	Hydrophytic Vegetation Present? <u>YES</u>	

Remarks: (If observed, list morphological adaptations below).



WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

2020-W3-Up

Project Site: SCAP Highgate City/County: Highgate/Franklin Samp. Date: 5/15/2020
Applicant/Owner: VELCO State: Vermont Sampling Point: 2020-W3-Up
Investigator(s): RMS/JWS Section, Township, Range:
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 3 to 8
Subregion (LRR or MLRA): LRR R Lat: Long: Datum: NAD 83
Soil Map Unit: Windsor loamy fine sand NWI Class:
Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? No Normal Circumstances? Yes
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? NO
Hydric Soil Present? NO
Wetland Hydrology Present? NO
Is This Sample Area Within a Wetland? NO
Remarks: Partially maintained ROW; Riparian system

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9) Surface Soil Cracks (B6)
High Water Table (A2) Aquatic Fauna (B13) Drainage Patterns (B10)
Saturation (A3) Marl Deposits (B13) Moss Trim Lines (B16)
Water Marks (B1) Hydrogen Sulfide Odor (C1) Dry-Season Water Table (C2)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3) Crayfish Burrows (C8)
Drift Deposits (B3) Presence of Reduced Iron (C4) Saturation Visible on Aerial (C9)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6) Stunted or Stressed Plants (D1)
Iron Deposits (B5) Thin Muck Surface (C7) Geomorphic Position (D2)
Inundation Visible on Aerial (B7) Other (Explain in Remarks) Shallow Aquitard (D3)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5) Microtopographic Relief (D4)

Field Observations:
Surface Water Present? Depth (inches):
Water Table Present? Depth (inches):
Saturation Present? Depth (inches):
Wetland Hydrology Present? NO

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
0.03" of rain in 7 days prior in Highgate, VT (NWS 2018); PDSI 1.70 (Near Normal) for week ending 5/16/2020

Remarks:

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)
Table with columns: Depth, Matrix, Redox Features, Texture, Remarks.
0-4 10 YR 4/4 100 SANDY LOAM
4-16+ 10 YR 4/6 100 SANDY LOAM

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. 2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:
Histosol (A1) Polyvalue Below Surface (S8) (LRR R, MLRA 149B) 2 cm Muck (A10) (LRR K, L, MLRA 149B)
Histic Epipedon (A2) MLRA 149B) Coast Prairie Redox (A16) (LRR K, L, R)
Black Histic (A3) Thin Dark Surface (S9) (LRR R, MLRA 149B) 5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) (LRR K, L) Dark Surface (S9) (LRR K, L, M)
Stratified Layers (A5) Loamy Gleyed Matrix (F2) Polyvalue Below Surface (S8) (LRR K, L)
Depleted Below Dark Surface (A11) Depleted Matrix (F3) Thin Dark Surface (S9) (LRR K, L)
Thick Dark Surface (A12) Redox Dark Surface (F6) Iron-Manganese Masses (F12) (LRR K, L, R)
Sandy Mucky Mineral (S1) Depleted Dark Surface (F7) Piedmont Floodplain Soils (F19) (MLRA 149B)
Sandy Gleyed Matrix (S4) Redox Depressions (F8) Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
Sandy Redox (S5) Red Parent Material (F21)
Stripped Matrix (S6) Very Shallow Dark Surface (TF12)
Dark Surface (S7) (LRR R, MLRA 149B) 3Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic. Other (Explain in Remarks)

Restrictive Layer (if observed):
Type:
Depth (inches):
Hydric Soil Present? NO

Tree Stratum	(Plot size: <u>30' RAD</u> )	Absolute % Cover	Dom. Sp?	Indicator Status	
1.	_____	_____	_____	_____	Dominance Test Worksheet: # Dominants OBL, FACW, FAC: <u>1</u> (A)  # Dominants across all strata: <u>2</u> (B)  % Dominants OBL, FACW, FAC: <u>50%</u> (A/B)
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
_____ = Total Cover					Prevalence Index Worksheet: Total % Cover of: _____ Multiply By: _____ OBL _____ x 1 = _____ FACW <u>34</u> x 2 = <u>68</u> FAC _____ x 3 = _____ FACU <u>24</u> x 4 = <u>96</u> UPL <u>38</u> x 5 = <u>190</u> Sum: <u>96</u> (A) <u>354</u> (B)  Prevalence Index = B/A = <u>3.69</u>
Sapling Stratum	(Plot size: <u>15' RAD</u> )	Absolute % Cover	Dom. Sp?	Indicator Status	
1.	_____	_____	_____	_____	
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
_____ = Total Cover					
Shrub Stratum	(Plot size: <u>15' RAD</u> )	Absolute % Cover	Dom. Sp?	Indicator Status	
1.	<u>Spiraea alba</u>	<u>20.5</u>	<u>X</u>	<u>FACW</u>	Hydrophytic Vegetation Indicators: _____ Dominance Test is > 50% _____ Prevalence Index is <= 3.0 _____ Problematic Hydrophytic Vegetation <sup>1</sup> (explain) _____ Rapid Test for Hydrophytic Vegetation _____ Morphological Adaptations  <sup>1</sup> Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.
2.	<u>Salix bebbiana</u>	<u>3</u>		<u>FACW</u>	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
<u>23.5</u> = Total Cover					
Herb Stratum	(Plot size: <u>5' RAD</u> )	Absolute % Cover	Dom. Sp?	Indicator Status	
1.	<u>Bromus inermis</u>	<u>38</u>	<u>X</u>	<u>UPL</u>	Definitions of Vegetation Strata:  Tree - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and 3in (7.6cm) or larger in diameter at breast height (DBH).  Sapling - Woody plants, excluding woody vines, approximately 20ft (6m) or more in height and less than 3in (7.6cm) DBH.  Shrub - Woody plants, excluding woody vines, approximately 3 to 20ft (1 to 6m) in height.  Herb - All herbaceous (non-woody) plants, including herbaceous vines, regardless of size. Includes woody plants, except woody vines, less than approximately 3ft (1m) in height.  Woody vine - All woody vines, regardless of height.
2.	<u>Galium mollugo</u>	<u>10.5</u>		<u>FACU</u>	
3.	<u>Taraxacum officinale</u>	<u>10.5</u>		<u>FACU</u>	
4.	<u>Onoclea sensibilis</u>	<u>10.5</u>		<u>FACW</u>	
5.	<u>Solidago canadensis</u>	<u>3</u>		<u>FACU</u>	
6.	_____	_____	_____	_____	
7.	_____	_____	_____	_____	
8.	_____	_____	_____	_____	
9.	_____	_____	_____	_____	
10.	_____	_____	_____	_____	
11.	_____	_____	_____	_____	
12.	_____	_____	_____	_____	
<u>72.5</u> = Total Cover					
Woody Vines	(Plot size: <u>15' RAD</u> )	Absolute % Cover	Dom. Sp?	Indicator Status	
1.	_____	_____	_____	_____	Hydrophytic Vegetation Present? <u>NO</u>
2.	_____	_____	_____	_____	
3.	_____	_____	_____	_____	
4.	_____	_____	_____	_____	
5.	_____	_____	_____	_____	
_____ = Total Cover					

Remarks: (If observed, list morphological adaptations below).



WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

2020-W5-Wet

Project Site: SCAP Highgate City/County: Highgate/Franklin Samp. Date: 5/15/2020
Applicant/Owner: VELCO State: Vermont Sampling Point: 2020-W5-Wet
Investigator(s): RMS/JWS Section, Township, Range:
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 3 to 8
Subregion (LRR or MLRA): LRR R Lat: Long: Datum: NAD 83
Soil Map Unit: Raynham silt loam NWI Class: PEM
Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? No Normal Circumstances? Yes
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? YES
Hydric Soil Present? YES
Wetland Hydrology Present? YES
Is This Sample Area Within a Wetland? YES
Remarks: Forested

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9)
X High Water Table (A2) Aquatic Fauna (B13)
X Saturation (A3) Marl Deposits (B13)
Water Marks (B1) Hydrogen Sulfide Odor (C1)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3)
Drift Deposits (B3) Presence of Reduced Iron (C4)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6)
Iron Deposits (B5) Thin Muck Surface (C7)
Inundation Visible on Aerial (B7) Other (Explain in Remarks)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Depth (inches):
Water Table Present? X Depth (inches): 4
Saturation Present? X Depth (inches): Surface
Wetland Hydrology Present? YES

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
0.03" of rain in 7 days prior in Highgate, VT (NWS 2018); PDSI 1.70 (Near Normal) for week ending 5/16/2020

Remarks:

SOIL

Table with 8 columns: Depth, Matrix, Redox Features, Type, Loc, Texture, Remarks. Rows include 0-4, 4-8, and 8-16+ depth intervals with soil characteristics like color, moisture, and texture.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. 2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:
Histosol (A1) Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
Histic Epipedon (A2) MLRA 149B
Black Histic (A3) Thin Dark Surface (S9) (LRR R, MLRA 149B)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) (LRR K, L)
Stratified Layers (A5) Loamy Gleyed Matrix (F2)
Depleted Below Dark Surface (A11) X Depleted Matrix (F3)
Thick Dark Surface (A12) Redox Dark Surface (F6)
Sandy Mucky Mineral (S1) Depleted Dark Surface (F7)
Sandy Gleyed Matrix (S4) Redox Depressions (F8)
Sandy Redox (S5)
Stripped Matrix (S6)
Dark Surface (S7) (LRR R, MLRA 149B)
Indicators for Problematic Hydric Soils3:
2 cm Muck (A10) (LRR K, L, MLRA 149B)
Coast Prairie Redox (A16) (LRR K, L, R)
5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
Dark Surface (S9) (LRR K, L, M)
Polyvalue Below Surface (S8) (LRR K, L)
Thin Dark Surface (S9) (LRR K, L)
Iron-Manganese Masses (F12) (LRR K, L, R)
Piedmont Floodplain Soils (F19) (MLRA 149B)
Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
Red Parent Material (F21)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

Restrictive Layer (if observed):
Type:
Depth (inches):
Hydric Soil Present? YES
Northcentral and Northeast Region - Version 2.0





WETLAND DETERMINATION DATA FORM - Northcentral and Northeast Region

2020-W5-Up

Project Site: SCAP Highgate City/County: Highgate/Franklin Samp. Date: 5/15/2020
Applicant/Owner: VELCO State: Vermont Sampling Point: 2020-W5-Up
Investigator(s): RMS/JWS Section, Township, Range:
Landform (hillslope, terrace, etc.): Terrace Local relief (concave, convex, none): Concave Slope (%): 3 to 8
Subregion (LRR or MLRA): LRR R Lat: Long: Datum: NAD 83
Soil Map Unit: Raynham silt loam NWI Class:
Are climatic/hydrologic conditions on the site typical for this time of year? Yes (If no, explain in Remarks.)
Are Vegetation, Soil, or Hydrology significantly disturbed? No Normal Circumstances? Yes
Are Vegetation, Soil, or Hydrology naturally problematic? No (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS - Attach site map showing sample point locations, transects, important features, etc.

Hydrophytic Vegetation Present? NO
Hydric Soil Present? NO
Wetland Hydrology Present? NO
Is This Sample Area Within a Wetland? NO
Remarks: Forested

HYDROLOGY

Wetland Hydrology Indicators:
Primary Indicators (minimum of one is required; check all that apply)
Secondary Indicators (minimum of two required)
Surface Water (A1) Water-Stained Leaves (B9)
High Water Table (A2) Aquatic Fauna (B13)
Saturation (A3) Marl Deposits (B13)
Water Marks (B1) Hydrogen Sulfide Odor (C1)
Sediment Deposits (B2) Oxidized Rhizospheres on Living Roots (C3)
Drift Deposits (B3) Presence of Reduced Iron (C4)
Algal Mat or Crust (B4) Recent Iron Reduction in Tilled Soils (C6)
Iron Deposits (B5) Thin Muck Surface (C7)
Inundation Visible on Aerial (B7) Other (Explain in Remarks)
Sparsely Vegetated Concave Surface (B8) FAC-Neutral Test (D5)

Field Observations:
Surface Water Present? Depth (inches):
Water Table Present? Depth (inches):
Saturation Present? Depth (inches):
Wetland Hydrology Present? NO

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:
0.03" of rain in 7 days prior in Highgate, VT (NWS 2018); PDSI 1.70 (Near Normal) for week ending 5/16/2020

Remarks:

SOIL

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)
Table with columns: Depth, Matrix, Redox Features, Texture, Remarks.
Rows: 0-4, 4-10, 10-16+ showing 10 YR 2/2, 100% moisture, SANDY LOAM texture.

1Type: C=Concentration, D=Depletion, RM=Reduced Matrix, MS=Masked Sand Grains. 2Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators:
Histosol (A1) Polyvalue Below Surface (S8) (LRR R, MLRA 149B)
Histic Epipedon (A2) MLRA 149B
Black Histic (A3) Thin Dark Surface (S9) (LRR R, MLRA 149B)
Hydrogen Sulfide (A4) Loamy Mucky Mineral (F1) (LRR K, L)
Stratified Layers (A5) Loamy Gleyed Matrix (F2)
Depleted Below Dark Surface (A11) Depleted Matrix (F3)
Thick Dark Surface (A12) Redox Dark Surface (F6)
Sandy Mucky Mineral (S1) Depleted Dark Surface (F7)
Sandy Gleyed Matrix (S4) Redox Depressions (F8)
Sandy Redox (S5)
Stripped Matrix (S6)
Dark Surface (S7) (LRR R, MLRA 149B)
Indicators for Problematic Hydric Soils3:
2 cm Muck (A10) (LRR K, L, MLRA 149B)
Coast Prairie Redox (A16) (LRR K, L, R)
5 cm Mucky Peat or Peat (S3) (LRR K, L, R)
Dark Surface (S9) (LRR K, L, M)
Polyvalue Below Surface (S8) (LRR K, L)
Thin Dark Surface (S9) (LRR K, L)
Iron-Manganese Masses (F12) (LRR K, L, R)
Piedmont Floodplain Soils (F19) (MLRA 149B)
Mesic Spodic (TA6) (MLRA 144A, 145, 149B)
Red Parent Material (F21)
Very Shallow Dark Surface (TF12)
Other (Explain in Remarks)

Restrictive Layer (if observed):
Type:
Depth (inches):
Hydric Soil Present? NO
Northcentral and Northeast Region - Version 2.0



## ATTACHMENT 5

**Vermont Potential Rare, Threatened, and Endangered Species and Natural Communities in the Project Region and Onsite Habitats Summary**

**Project:** SCAP Highgate

**Client:** VELCO

**Location:** Highgate, Vermont

**Prepared By:** VHB (R. Scott) - July 27, 2022

**Vermont Natural Heritage Inventory Database Query Radius:** One Mile

Species	Common Name(s)	Type	State Rank	Global Rank	Vermont Status	Federal Status	EO Last Observed	Habitat Description <sup>1</sup>	Occurrence Description <sup>2</sup>	Optimal Survey Time <sup>1</sup>	EO Mapped within Map Extent (Yes/No)	Potential for Habitat to Occur Onsite? (Yes/No)	Survey Recommended?	
													(Yes/No)	Comments
<i>Ammocryota pellucida</i>	Eastern Sand Darter	Animal	S1	G4	-	-	2018	Sandy runs of small to medium sized rivers	Observed in Missisquoi River and Dead Creek.	-	No	No	No	Not a listed species.
<i>Anemone multifida var. multifida</i>	Early Thimbleweed	Plant	S1	G5T5	-	E	1873	High pH river shore outcrops	Highgate Springs or Highgate Falls - no specific location provided.	-	No	No	No	No habitat present
<i>Anodontoides ferussacianus</i>	Cylindrical Papershell	Animal	S1S2	G5	E	-	1983	Shallow water small streams and the headwaters of larger streams preferring sandy or muddy substrates	Missisquoi River in East Highgate, Hungerford Brook and Lower Missisquoi River	-	No	Yes	No	No in-stream work proposed
<i>Bartramia longicauda</i>	Upland Sandpiper	Animal	S2B	G5	E	-	2018	Open tracts of short grassland.	Route 207 and Rainville Road	-	No	Yes	No	No surveys proposed.
<i>Esox masquinongy</i>	Muskellunge	Animal	S1	G5	-	-	1981	Clear vegetated lakes, quiet pools and backwaters of creeks and small to large rivers	Missisquoi River - Highgate Dam to Swanton Dam	-	No	No	No	No habitat present
<i>Lampsilis ovata</i>	Pocketbook	Animal	S2	G5	E	-	2019	Large rivers with loose to firmly-packed sand, gravel-sand, or silty substrates.	Observed in Missisquoi River at the confluences of Dead Creek and Hungerford Brook.	-	No	No	No	No habitat present
<i>Lasmigona costata</i>	Fluted-shell	Animal	S2	G5	E	-	1998	Medium to large rivers with sand, mud, or fine gravel substrates with slow to moderate flow.	Missisquoi River below Highgate Dam	-	No	No	No	No habitat present
<i>Lethenteron appendix</i>	American Brook Lamprey	Animal	S1	G4	-	-	2013	Adults in gravel-sand riffles and runs of creeks and small to medium rivers with strong flow.	Lower Missisquoi River	-	No	No	No	No habitat present
<i>Ligumia recta</i>	Black Sandshell	Animal	S1	G4G5	E	-	1998	Riffle and run areas of large rivers in sand or gravel and lakes with sandy mud, firm sand, or gravel.	Missisquoi River below Highgate Dam and Lower Missisquoi River	-	No	No	No	No habitat present
<i>Monarda punctata</i>	Dotted horsemint	Plant	S1	G5	-	-	2017	Dry and especially sandy soils in fields, roadsides and clearings	Highgate Center Railroad	-	No	Yes	Yes	Identified as a target species for partial floristic survey. No individuals identified
<i>Moxostoma anisurum</i>	Silver Redhorse	Animal	S2	G5	-	-	2000	Mud- to rock-bottomed pools and runs of small to large rivers; occasionally lakes	Lower Missisquoi River	-	No	No	No	No habitat present

**Vermont Potential Rare, Threatened, and Endangered Species and Natural Communities in the Project Region and Onsite Habitats Summary**

**Project:** SCAP Highgate

**Client:** VELCO

**Location:** Highgate, Vermont

**Prepared By:** VHB (R. Scott) - July 27, 2022

**Vermont Natural Heritage Inventory Database Query Radius:** One Mile

Species	Common Name(s)	Type	State Rank	Global Rank	Vermont Status	Federal Status	EO Last Observed	Habitat Description <sup>1</sup>	Occurrence Description <sup>2</sup>	Optimal Survey Time <sup>1</sup>	EO Mapped within Map Extent (Yes/No)	Potential for Habitat to Occur Onsite? (Yes/No)	Survey Recommended?	
													(Yes/No)	Comments
<i>Moxostoma macrolepidotum</i>	Shorthead Redhorse	Animal	S2	G5	-	-	2011	Rocky pools, runs and riffles in small to large rivers	Lower Missisquoi River	-	No	No	No	No habitat present
<i>Moxostoma valenciennesi</i>	Greater Redhorse	Animal	S1	G4	-	-	2011	Sandy to rocky pools and runs of medium to large rivers	Lower Missisquoi River	-	No	No	No	No habitat present
<i>Noturus flavus</i>	Stonecat	Animal	S1	G5	-	-	2011	Rubble and boulder riffles and runs of creeks and small to large rivers; gravel shoals of lakes	Missisquoi River - Highgate Dam to Swanton Dam, and Lower Missisquoi River	-	No	No	No	No habitat present
<i>Pyganodon grandis</i>	Giant Floater	Animal	S2S3	G5	T	-	2019	Shallow streams, lakes and pools with fine sediment. Areas dominated by sand and gravel with little to no flow.	Charcoal Creek, Lower Missisquoi River, and Dead Creek in Highgate	-	No	Yes	No	No in-stream work proposed
-	Silver Maple-Ostrich Fern Floodplain Forest	NatCom	S3	-	-	-	1992	Low to moderate gradient portions of major rivers	Group of islands within Missisquoi River	-	No	No	No	No present

**<sup>1</sup>Potential Sources for Habitat Description and Optimal Survey Time:**

DeGraaf, R.M. and M. Yamasaki. 2001. *New England Wildlife: Habitat, Natural History, and Distribution*. University Press of New England. Lebanon, NH.  
 Gilman, A.V. 2015. *New Flora of Vermont*. The New York Botanical Garden.  
 Gleason, H. A. and A. Cronquist. 1991. *Manual of Vascular Plants of Northeast United States and Adjacent Canada*. The New York Botanical Garden.  
 Haines, A. 2011. *Flora Novae Angliae*. New England Wildflower Society / Yale University Press, New Haven, CT.  
 Langdon, R.W., Ferguson, M.T., and K.M. Cox. 2006. *Fishes of Vermont*. Vermont Department of Fish and Wildlife.  
 Magee, D.W., and H.E. Ahles. 2007. *Flora of the Northeast: A Manual of the Vascular Flora of New England Adjacent New York*. University of Massachusetts Press. Amherst, MA.  
 Natural Resources Conservation Service. 2010. *Management Considerations for Grassland Birds in Northeastern Haylands and Pasturelands*. Wildlife Insight No. 88.  
 Newcomb, L. 1977. *Newcomb's Wildflower Guide*. Little, Brown, and Company, Boston, MA.  
 Seymour, F.C. 1982. *The Flora of New England*. Second Edition. Phytologia Memoirs 5. Plainfield, NJ: Harold N. Moldenke and Alma L. Moldenke.  
 Thompson, et. al. 2019. *Wetland, Woodland, Wildland: A Guide to the Natural Communities of Vermont*. Vermont Department of Fish and Wildlife and The Nature Conservancy.  
 Vermont Natural Heritage Inventory. 2022. Element Occurrence Reports. Fish and Wildlife Department. Accessed July 2022.  
 Vickery, P.D., D.E. Blanco, and B. Lopez-Lanus. 2010. *Conservation Plan for the Upland Sandpiper (Bartramia longicauda)*. Version 1.1. Manomet Center for Conservation Sciences, Manomet, MA.

**<sup>2</sup>Sources for Occurrence Description:**

Vermont Natural Heritage Inventory. 2022. Element Occurrence Reports. Fish and Wildlife Department. Accessed February 2022.

## ATTACHMENT 6



# United States Department of the Interior



FISH AND WILDLIFE SERVICE  
New England Ecological Services Field Office  
70 Commercial Street, Suite 300  
Concord, NH 03301-5094  
Phone: (603) 223-2541 Fax: (603) 223-0104

In Reply Refer To:  
Project Code: 2022-0069053  
Project Name: Highgate SCAP

July 29, 2022

Subject: List of threatened and endangered species that may occur in your proposed project location or may be affected by your proposed project

To Whom It May Concern:

*Please review this letter each time you request an Official Species List, we will continue to update it with additional information and links to websites may change.*

## **About Official Species Lists**

The purpose of the Act is to provide a means whereby threatened and endangered species and the ecosystems upon which they depend may be conserved. Federal and non-Federal project proponents have responsibilities under the Act to consider effects on listed species.

The enclosed species list identifies threatened, endangered, proposed, and candidate species, as well as proposed and final designated critical habitat, that may occur within the boundary of your proposed project and/or may be affected by your proposed project. The species list fulfills the requirements of the U.S. Fish and Wildlife Service (Service) under section 7(c) of the Endangered Species Act (Act) of 1973, as amended (16 U.S.C. 1531 et seq.).

New information based on updated surveys, changes in the abundance and distribution of species, changed habitat conditions, or other factors could change this list. Please note that under 50 CFR 402.12(e) of the regulations implementing section 7 of the Act, the accuracy of this species list should be verified after 90 days. The Service recommends that verification be completed by visiting the ECOS-IPaC website at regular intervals during project planning and implementation for updates to species lists and information. An updated list may be requested by returning to an existing project's page in IPaC.

## **Endangered Species Act Project Review**

Please visit the “**New England Field Office Endangered Species Project Review and Consultation**” website for step-by-step instructions on how to consider effects on listed

species and prepare and submit a project review package if necessary:

<https://www.fws.gov/office/new-england-ecological-services/endangered-species-project-review>

**\*NOTE\*** Please do not use the **Consultation Package Builder** tool in IPaC except in specific situations following coordination with our office. Please follow the project review guidance on our website instead and reference your **Project Code** in all correspondence.

**Northern Long-eared Bat Update** - Additionally, please note that on March 23, 2022, the Service published a proposal to reclassify the northern long-eared bat (NLEB) as endangered under the Endangered Species Act. The U.S. District Court for the District of Columbia has ordered the Service to complete a new final listing determination for the NLEB by November 2022 (Case 1:15-cv-00477, March 1, 2021). The bat, currently listed as threatened, faces extinction due to the range-wide impacts of white-nose syndrome (WNS), a deadly fungal disease affecting cave-dwelling bats across the continent. The proposed reclassification, if finalized, would remove the current 4(d) rule for the NLEB, as these rules may be applied only to threatened species. Depending on the type of effects a project has on NLEB, the change in the species' status may trigger the need to re-initiate consultation for any actions that are not completed and for which the Federal action agency retains discretion once the new listing determination becomes effective (anticipated to occur by December 30, 2022). If your project may result in incidental take of NLEB after the new listing goes into effect this will first need to be addressed in an updated consultation that includes an Incidental Take Statement. If your project may require re-initiation of consultation, please contact our office for additional guidance.

#### *Additional Info About Section 7 of the Act*

Under section 7(a)(2) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to determine whether projects may affect threatened and endangered species and/or designated critical habitat. If a Federal agency, or its non-Federal representative, determines that listed species and/or designated critical habitat may be affected by the proposed project, the agency is required to consult with the Service pursuant to 50 CFR 402. In addition, the Federal agency also may need to consider proposed species and proposed critical habitat in the consultation. 50 CFR 402.14(c)(1) specifies the information required for consultation under the Act regardless of the format of the evaluation. More information on the regulations and procedures for section 7 consultation, including the role of permit or license applicants, can be found in the "Endangered Species Consultation Handbook" at:

<https://www.fws.gov/service/section-7-consultations>

In addition to consultation requirements under Section 7(a)(2) of the ESA, please note that under sections 7(a)(1) of the Act and its implementing regulations (50 CFR 402 et seq.), Federal agencies are required to utilize their authorities to carry out programs for the conservation of threatened and endangered species. Please contact NEFO if you would like more information.

**Candidate species** that appear on the enclosed species list have no current protections under the

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ESA. The species' occurrence on an official species list does not convey a requirement to consider impacts to this species as you would a proposed, threatened, or endangered species. The ESA does not provide for interagency consultations on candidate species under section 7, however, the Service recommends that all project proponents incorporate measures into projects to benefit candidate species and their habitats wherever possible.

### **Migratory Birds**

In addition to responsibilities to protect threatened and endangered species under the Endangered Species Act (ESA), there are additional responsibilities under the Migratory Bird Treaty Act (MBTA) and the Bald and Golden Eagle Protection Act (BGEPA) to protect native birds from project-related impacts. Any activity, intentional or unintentional, resulting in take of migratory birds, including eagles, is prohibited unless otherwise permitted by the U.S. Fish and Wildlife Service (50 C.F.R. Sec. 10.12 and 16 U.S.C. Sec. 668(a)). For more information regarding these Acts see:

<https://www.fws.gov/program/migratory-bird-permit>

<https://www.fws.gov/library/collections/bald-and-golden-eagle-management>

Please feel free to contact us at **newengland@fws.gov** with your **Project Code** in the subject line if you need more information or assistance regarding the potential impacts to federally proposed, listed, and candidate species and federally designated and proposed critical habitat.

Attachment(s): Official Species List

Attachment(s):

- Official Species List
-

## **Official Species List**

This list is provided pursuant to Section 7 of the Endangered Species Act, and fulfills the requirement for Federal agencies to "request of the Secretary of the Interior information whether any species which is listed or proposed to be listed may be present in the area of a proposed action".

This species list is provided by:

### **New England Ecological Services Field Office**

70 Commercial Street, Suite 300

Concord, NH 03301-5094

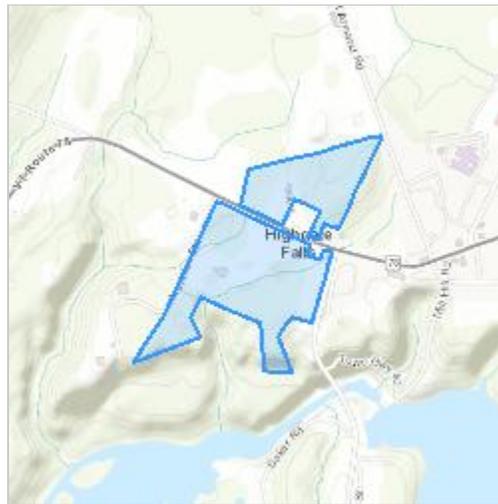
(603) 223-2541

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## Project Summary

Project Code: 2022-0069053  
Project Name: Highgate SCAP  
Project Type: Utility Infrastructure Maintenance  
Project Description: Electric substation rebuild.  
Project Location:

Approximate location of the project can be viewed in Google Maps: <https://www.google.com/maps/@44.9376926,-73.05284147725044,14z>



Counties: Franklin County, Vermont

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## Endangered Species Act Species

There is a total of 2 threatened, endangered, or candidate species on this species list.

Species on this list should be considered in an effects analysis for your project and could include species that exist in another geographic area. For example, certain fish may appear on the species list because a project could affect downstream species.

IPaC does not display listed species or critical habitats under the sole jurisdiction of NOAA Fisheries<sup>1</sup>, as USFWS does not have the authority to speak on behalf of NOAA and the Department of Commerce.

See the "Critical habitats" section below for those critical habitats that lie wholly or partially within your project area under this office's jurisdiction. Please contact the designated FWS office if you have questions.

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1. [NOAA Fisheries](#), also known as the National Marine Fisheries Service (NMFS), is an office of the National Oceanic and Atmospheric Administration within the Department of Commerce.

### Mammals

NAME	STATUS
Northern Long-eared Bat <i>Myotis septentrionalis</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9045">https://ecos.fws.gov/ecp/species/9045</a>	Threatened

### Insects

NAME	STATUS
Monarch Butterfly <i>Danaus plexippus</i> No critical habitat has been designated for this species. Species profile: <a href="https://ecos.fws.gov/ecp/species/9743">https://ecos.fws.gov/ecp/species/9743</a>	Candidate

### Critical habitats

THERE ARE NO CRITICAL HABITATS WITHIN YOUR PROJECT AREA UNDER THIS OFFICE'S JURISDICTION.

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## **IPaC User Contact Information**

Agency: Vanasse Hangen Brustlin, Inc.

Name: Ryan Scott

Address: 40 IDX Drive, Building 100, Suite 200

City: South Burlington

State: VT

Zip: 05403

Email: rscott@vhb.com

Phone: 2072190645

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# ATTACHMENT 7

Project: VELCO Highgate SCAP  
 Species Checklist - Floristic Inventory  
 Date: October 14, 2020  
 Survey Dates: August 2 and August 9, 2020

Scientific Name <sup>1</sup>	Common Name	Family	Observed Habitat			VT Rarity Rank <sup>2</sup>	Non-Native Invasive Species <sup>3</sup>
			Substation Yard/ Edge	Forest and Upland Naturalized	Wetland (Emergent Scrub-Shrub)		
Acer negundo L.	boxelder	Aceraceae		X			
Acer pensylvanicum L.	striped maple	Aceraceae		X			
Acer platanoides L.	Norway maple	Aceraceae	X				B
Acer rubrum L.	red maple	Aceraceae		X	X		
Acer saccharum Marshall	sugar maple	Aceraceae		X			
Achillea millefolium L.	common yarrow	Asteraceae	X				
Actaea pachypoda Elliott	white baneberry	Ranunculaceae		X			
Actaea rubra (Aiton) Willd.	red baneberry	Ranunculaceae		X			
Agalinis pauperula (A. Gray) Britton	smallflower false foxglove	Scrophulariaceae		X		SU	
Ageratina altissima (L.) R.M. King & H. Rob.	white snakeroot	Asteraceae		X			
Agrostis gigantea Roth	redtop	Poaceae	X		X		
Alliaria petiolata (M. Bieb.) Cavara & Grande	garlic mustard	Brassicaceae		X			B
Alnus glutinosa (L.) Gaertn.	European alder	Betulaceae	X	X	X		W
Ambrosia artemisiifolia L.	annual ragweed	Asteraceae	X	X			
Amphicarpaea bracteata (L.) Fernald	American hogpeanut	Fabaceae		X			
Anemone canadensis L.	Canadian anemone	Ranunculaceae		X			
Anthoxanthum odoratum L.	sweet vernalgrass	Poaceae	X	X			
Apocynum androsaemifolium L.	spreading dogbane	Apocynaceae		X			
Aquilegia canadensis L.	red columbine	Ranunculaceae		X			
Aralia hispida Vent.	bristly sarsaparilla	Araliaceae		X			
Arisaema triphyllum (L.) Schott	Jack in the pulpit	Araceae		X			
Artemisia vulgaris L.	common wormwood	Asteraceae	X				
Asclepias syriaca L.	common milkweed	Asclepiadaceae	X	X			
Athyrium filix-femina (L.) Roth ssp. angustum (Willd.) R.T. Clausen	subarctic ladyfern	Dryopteridaceae		X			
Betula alleghaniensis Britton	yellow birch	Betulaceae		X			
Betula populifolia Marshall	gray birch	Betulaceae		X			
Bidens cernua L.	nodding beggartick	Asteraceae		X	X		
Bromus ciliatus L.	fringed brome	Poaceae	X				
Calystegia sepium (L.) R. Br.	hedge false bindweed	Convolvulaceae		X			
Calystegia spithamea (L.) Pursh	low false bindweed	Convolvulaceae		X		S2, T	
Carex gynandra Schwein.	nodding sedge	Cyperaceae			X		
Carex intumescens Rudge	greater bladder sedge	Cyperaceae		X			
Carex lupulina Muhl. ex Willd.	hop sedge	Cyperaceae			X		
Carex normalis Mack.	greater straw sedge	Cyperaceae		X			
Carex plantaginea Lam.	plantainleaf sedge	Cyperaceae		X			
Carex rosea Schkuhr ex Willd.	rosy sedge	Cyperaceae		X			
Carex scoparia Schkuhr ex Willd.	broom sedge	Cyperaceae			X		
Carex vulpinoidea Michx.	fox sedge	Cyperaceae			X		
Carpinus caroliniana Walter	American hornbeam	Betulaceae		X			
Chamaesyce maculata (L.) Small	spotted sandmat	Euphorbiaceae	X	X			
Chelidonium majus L.	celandine	Papaveraceae	X				
Chelone glabra L.	white turtlehead	Scrophulariaceae			X		
Cichorium intybus L.	chicory	Asteraceae	X				
Circaea xintermedia Ehrh. (pro sp.) [alpina x lutetiana]	enchanter's nightshade	Onagraceae		X			
Clematis virginiana L.	devil's darning needles	Ranunculaceae	X		X		
Comptonia peregrina (L.) J.M. Coult.	sweet fern	Myricaceae	X	X			
Convallaria majalis L.	European lily of the valley	Liliaceae		X			
Conyza canadensis (L.) Cronquist var. canadensis	Canadian horseweed	Asteraceae	X				
Cornus racemosa Lam.	gray dogwood	Cornaceae			X		
Cornus sericea L.	redosier dogwood	Cornaceae			X		
Dactylis glomerata L.	orchardgrass	Poaceae	X				
Daucus carota L.	Queen Anne's lace	Apiaceae	Z				
Dennstaedtia punctilobula (Michx.) T. Moore	eastern hayscented fern	Dennstaedtiaceae		X			
Desmodium glutinosum (Muhl. ex Willd.) Alph. Wood	pointedleaf ticktrefoil	Fabaceae		X			
Desmodium perplexum B.G. Schub.	perplexed ticktrefoil	Fabaceae	X	X		S2	
Dichanthelium acuminatum (Sw.) Gould & C.A. Clark var. acuminatum	tapered rosette grass	Poaceae	X	X			
Dichanthelium clandestinum (L.) Gould	deertongue	Poaceae	X	X			
Dichanthelium depauperatum (Muhl.) Gould	starved panicgrass	Poaceae	X	X			
Digitaria sanguinalis (L.) Scop.	hairy crabgrass	Poaceae	X				
Doellingeria umbellata (Mill.) Nees	parasol whitetop	Asteraceae			X		
Dryopteris marginalis (L.) A. Gray	marginal woodfern	Dryopteridaceae		X			
Echinochloa crus-galli (L.) P. Beauv.	barnyardgrass	Poaceae	X				
Elsholtzia ciliata (Thunb.) Hyl.	crested latesummer mint	Lamiaceae		X			
Epilobium ciliatum Raf.	fringed willowherb	Onagraceae			X		
Equisetum arvense L.	field horsetail	Equisetaceae		X			

Scientific Name <sup>1</sup>	Common Name	Family	Observed Habitat			VT Rarity Rank <sup>2</sup>	Non-Native Invasive Species <sup>3</sup>
			Substation Yard/ Edge	Forest and Upland Naturalized	Wetland (Emergent Scrub-Shrub)		
Equisetum hyemale L.	scouringrush horsetail	Equisetaceae	X	X			
Erigeron strigosus Muhl. ex Willd.	prairie fleabane	Asteraceae		X			
Euonymus alatus (Thunb.) Siebold	burningbush	Celastraceae		X			B
Eupatorium perfoliatum L.	common boneset	Asteraceae			X		
Eurybia divaricata (L.) G.L. Nesom	white wood aster	Asteraceae		X			
Euthamia graminifolia (L.) Nutt.	flat-top goldentop	Asteraceae		X	X		
Eutrochium maculatum (L.) E.E. Lamont	spotted joe pye weed	Asteraceae			X		
Fagus grandifolia Ehrh.	American beech	Fagaceae		X			
Fraxinus pennsylvanica Marshall	green ash	Oleaceae		X			
Galium mollugo L.	false baby's breath	Rubiaceae	X				
Gaultheria procumbens L.	eastern teaberry	Ericaceae		X			
Gentiana clausa Raf.	bottle gentian	Gentianaceae		X	X		
Geranium robertianum L.	Robert geranium	Geraniaceae		X			
Waldsteinia fragarioides (Michx.) Tratt.	Appalachian barren	Rosaceae		X			
Hamamelis virginiana L.	American witchhazel	Hamamelidaceae		X			
Hieracium aurantiacum L.	orange hawkweed	Asteraceae	X				
Hieracium caespitosum Dumort.	meadow hawkweed	Asteraceae	X				
Hylotelephium telephium (L.) H. Ohba	witch's moneybags	Crassulaceae	X				
Hypericum punctatum Lam.	spotted St. Johnswort	Clusiaceae	X				
Ilex verticillata (L.) A. Gray	common winterberry	Aquifoliaceae			X		
Impatiens capensis Meerb.	jewelweed	Balsaminaceae			X		
Juncus effusus L.	common rush	Juncaceae			X		
Juncus tenuis Willd.	poverty rush	Juncaceae	X				
Lactuca biennis (Moench) Fernald	tall blue lettuce	Asteraceae		X			
Lactuca canadensis L.	Canada lettuce	Asteraceae		X			
Leersia oryzoides (L.) Sw.	rice cutgrass	Poaceae			X		
Linaria vulgaris Mill.	butter and eggs	Scrophulariaceae	X	X			
Lobelia inflata L.	Indian-tobacco	Campanulaceae		X			
Lonicera morrowii A. Gray	Morrow's honeysuckle	Caprifoliaceae		X			B
Lotus corniculatus L.	bird's-foot trefoil	Fabaceae	X				
Lysimachia quadrifolia L.	whorled yellow loosestrife	Primulaceae		X			
Lythrum salicaria L.	purple loosestrife	Lythraceae			X		B
Maianthemum canadense Desf.	Canada mayflower	Liliaceae		X			
Melilotus officinalis (L.) Lam.	sweetclover	Fabaceae		X			
Prenanthes alba L.	white rattlesnakeroot	Asteraceae		X			
Odontites vernus (Bellardi) Dumort.	red bartsia	Scrophulariaceae		X			
Oenothera parviflora L.	northern evening primrose	Onagraceae	X	X			
Onoclea sensibilis L.	sensitive fern	Dryopteridaceae		X	X		
Oryzopsis asperifolia Michx.	roughleaf ricegrass	Poaceae	X	X			
Osmunda cinnamomea L.	cinnamon fern	Osmundaceae		X			
Osmunda regalis L.	royal fern	Osmundaceae			X		
Oxalis stricta L.	common yellow oxalis	Oxalidaceae		X			
Panicum capillare L.	witchgrass	Poaceae		X			
Parthenocissus quinquefolia (L.) Planch.	Virginia creeper	Vitaceae		X	X		
Pastinaca sativa L.	wild parsnip	Apiaceae	X				
Penstemon hirsutus (L.) Willd.	hairy beardtongue	Scrophulariaceae		X		S3	
Phalaris arundinacea L.	reed canarygrass	Poaceae			X		W
Phleum pratense L.	timothy	Poaceae	X				
Phragmites australis (Cav.) Trin. ex Steud.	common reed	Poaceae	X				B
Physalis heterophylla Nees	clammy groundcherry	Solanaceae		X			
Pilea pumila (L.) A. Gray	Canadian clearweed	Urticaceae		X			
Pinus strobus L.	eastern white pine	Pinaceae		X			
Plantago lanceolata L.	narrowleaf plantain	Plantaginaceae	X				
Plantago major L.	common plantain	Plantaginaceae	X				
Polygonatum pubescens (Willd.) Pursh	hairy Solomon's seal	Liliaceae		X			
Polygonum sagittatum L.	arrowleaf tearthumb	Polygonaceae			X		
Polystichum acrostichoides (Michx.) Schott	Christmas fern	Dryopteridaceae		X			
Populus alba L.	white poplar	Salicaceae		X			
Populus tremuloides Michx.	quaking aspen	Salicaceae		X			
Potentilla recta L.	sulphur cinquefoil	Rosaceae		X			
Prunella vulgaris L.	common selfheal	Lamiaceae	X	X			
Prunus pensylvanica L. f.	pin cherry	Rosaceae		X			
Prunus serotina Ehrh.	black cherry	Rosaceae		X			
Pseudognaphalium obtusifolium (L.) Hilliard & B.L. Burt	rabbit-tobacco	Asteraceae	X				
Pteridium aquilinum (L.) Kuhn	western brackenfern	Dennstaedtiaceae	X				
Quercus alba L.	white oak	Fagaceae		X			
Quercus rubra L.	northern red oak	Fagaceae		X			
Ranunculus abortivus L.	littleleaf buttercup	Ranunculaceae		X	X		
Ranunculus repens L.	creeping buttercup	Ranunculaceae			X		
Rhamnus cathartica L.	common buckthorn	Rhamnaceae		X			B

Scientific Name <sup>1</sup>	Common Name	Family	Observed Habitat			VT Rarity Rank <sup>2</sup>	Non-Native Invasive Species <sup>3</sup>
			Substation Yard/ Edge	Forest and Upland Naturalized	Wetland (Emergent Scrub-Shrub)		
Rhus typhina L.	staghorn sumac	Anacardiaceae	X				
Robinia pseudoacacia L.	black locust	Fabaceae	X	X			W
Rubus canadensis L.	smooth blackberry	Rosaceae		X			
Rubus idaeus L.	American red raspberry	Rosaceae		X			
Rubus occidentalis L.	black raspberry	Rosaceae		X			
Rubus odoratus L.	purpleflowering raspberry	Rosaceae	X	X			
Rudbeckia hirta L.	blackeyed Susan	Asteraceae	X				
Rumex acetosa L.	garden sorrel	Polygonaceae	X				
Rumex obtusifolius L.	bitter dock	Polygonaceae	X				
Salix bebbiana Sarg.	Bebb willow	Salicaceae			X		
Salix discolor Muhl.	pussy willow	Salicaceae			X		
Sambucus racemosa L.	red elderberry	Caprifoliaceae		X			
Schizachyrium scoparium (Michx.) Nash	little bluestem	Poaceae	X				
Scirpus atrovirens Willd.	green bulrush	Cyperaceae			X		
Scirpus cyperinus (L.) Kunth	woolgrass	Cyperaceae			X		
Scutellaria lateriflora L.	blue skullcap	Lamiaceae			X		
Securigera varia (L.) Lassen	crownvetch	Fabaceae	X				
Setaria pumila (Poir.) Roem. & Schult.	yellow foxtail	Poaceae	X				
Silene vulgaris (Moench) Garcke	maidenstears	Caryophyllaceae	X				
Solanum dulcamara L.	climbing nightshade	Solanaceae	X		X		
Solidago altissima L.	Canada goldenrod	Asteraceae		X			
Solidago bicolor L.	white goldenrod	Asteraceae		X			
Solidago canadensis L.	Canada goldenrod	Asteraceae	X	X			
Solidago nemoralis Aiton	gray goldenrod	Asteraceae		X			
Solidago rugosa Mill.	wrinkleleaf goldenrod	Asteraceae			X		
Sonchus arvensis L.	field sowthistle	Asteraceae	X				
Spiraea alba Du Roi	white meadowsweet	Rosaceae			X		
Spiraea tomentosa L.	steeplebush	Rosaceae		X	X		
Spiranthes cernua (L.) Rich.	nodding lady's tresses	Orchidaceae	X				
Symphotrichum cordifolium (L.) G.L. Nesom	common blue wood aster	Asteraceae		X			
Symphotrichum novae-angliae (L.) G.L. Nesom	New England aster	Asteraceae	X				
Thalictrum dioicum L.	early meadow-rue	Ranunculaceae		X			
Thelypteris noveboracensis (L.) Nieuwl.	New York fern	Thelypteridaceae		X			
Thelypteris palustris Schott	eastern marsh fern	Thelypteridaceae			X		
Thuja occidentalis L.	arborvitae	Cupressaceae	X	X			
Tilia americana L.	American basswood	Tiliaceae		X			
Toxicodendron radicans (L.) Kuntze	eastern poison ivy	Anacardiaceae	X	X			
Trientalis borealis Raf.	starflower	Primulaceae		X			
Trifolium repens L.	white clover	Fabaceae	X				
Trillium undulatum Willd.	painted trillium	Liliaceae		X			
Tsuga canadensis (L.) Carrière	eastern hemlock	Pinaceae		X			
Tussilago farfara L.	coltsfoot	Asteraceae	X		X		
Typha latifolia L.	broadleaf cattail	Typhaceae			X		
Ulmus americana L.	American elm	Ulmaceae			X		
Vaccinium angustifolium Aiton	lowbush blueberry	Ericaceae		X			
Verbascum thapsus L.	common mullein	Scrophulariaceae	X				
Verbena hastata L.	swamp verbena	Verbenaceae			X		
Veronica scutellata L.	skullcap speedwell	Scrophulariaceae			X		
Viburnum acerifolium L.	mapleleaf viburnum	Caprifoliaceae		X			
Viburnum opulus L.	European cranberrybush	Caprifoliaceae		X			
Vicia cracca L.	bird vetch	Fabaceae	X				
Vitis aestivalis Michx.	summer grape	Vitaceae	X	X			

X - Plant species was found in this community type.

<sup>1</sup> Nomenclature follows USDA-NRCS PLANTS database (plants.usda.gov/) (2017).

<sup>2</sup> The Vermont Rarity Rank from the "Rare and Uncommon Native Vascular Plants of Vermont - Vermont Natural Heritage Inventory - Vermont Fish & Wildlife Department", version dated March 24, 2017.

<sup>3</sup> **Class B Noxious Weeds Species (B)** from: Quarantine #3- Noxious Weeds (2012). **Watch List Species (WL)** from: Vermont Wildlife Action Plan- Appendix K Exotic Invasive and Pest Species (2017). Vermont Fish & Wildlife Department