Appendix H

Vegetation and Habitat Report

DILLON CONSULTING

WOCAWSON ENERGY PROJECT

Vegetation Summary Report (Final)

August 2018 – 18-6975

Table of Contents

1.0 Introduction 1

1.1 Project Description 1
1.1.1 Siting Considerations 4
1.1.2 Physical Components of the Project 5
1.1.3 Project Schedule 6

2.0 Vegetation Survey Scope and Methodology 8

2.1 Scope of Work 8
2.1.1 Survey Protocols 8
2.1.2 Scope of Work 8
2.1.3 Spatial Boundaries 9
2.1.4 Temporal Boundaries 9
2.2 Methodology 11
2.2.1 Desktop Analysis Methods and Sources 11
2.2.2 Field Survey Methods 11

3.0 Vegetation Survey Results 12

3.1 Vegetation within the Assessment Area 12
3.1.1 Vegetation Species of Conservation Concern 12
3.1.2 Vegetation Species at Risk 13
3.2 Vegetation – Traditional Knowledge/Use Perspective 13

4.0 Assessment of Potential Environmental Interactions 15

4.1 Identification of Project Interactions 15
4.1.1 Approach to Project Components and Project Interaction Matrix 15
4.2 Assessment of Residual Environmental Effects 16
4.2.1 Identification of Potential Environmental Effects 16
4.2.2 Standard Mitigation of Potential Environmental Effects 16
4.2.3 Characterization of Residual Environmental Effects 17

5.0 Summary and Conclusion 19

6.0 Closure 20

Figures

Figure 1: Wocawson Energy Project Location 2
Figure 2: Wocawson Energy Project Site Plan 3
Figure 3: Anticipated Turbine Hub and Blade Lengths 6
Figure 4: Wocawson Energy Wind Project Assessment Area 10
Figure 5: Species of Conservation Concern Location 14

Tables

Table 1: Anticipated Project Schedule 7
Table 2: Project Interaction with Environmental Components 15
Table 3: Potential Effects of the Project on Vegetation 18

Appendices

A Vegetation Data
B Additional Site Photographs

References

1.0 Introduction

Dillon Consulting Limited (Dillon) was retained by the Wocawson Energy Limited Partnership (WLP) to complete natural environment surveys in support of a future provincial registration of an Environmental Impact Assessment (EIA) for the Wocawson Energy Project ("the proposed project"). WLP is a partnership between Tobique First Nation (51%) and Natural Forces Technologies Inc. ("Natural Forces") (49%).

The proposed project is located in an area that is mainly covered in vegetation (i.e. understory vegetation and forested habitat). Vegetation, including species at risk and species of conservation concern, is considered an important feature and a valued component (VC) related to the proposed project. Natural environment surveys for the proposed project were conducted for VCs of the environment based on an understanding of the environmental features of the proposed project area, the nature of the proposed project, and the potential interactions that may occur between the proposed project and the environment/VCs.

This report provides a summary of the vegetation surveys conducted in support of the Wocawson Energy Project EIA registration, and includes: a brief description of the proposed project; a description of the scope and methodology used for the vegetation surveys; a summary of the survey results; and, an assessment of residual effects (including potential interactions and mitigation) of the proposed project on the vegetated environment.

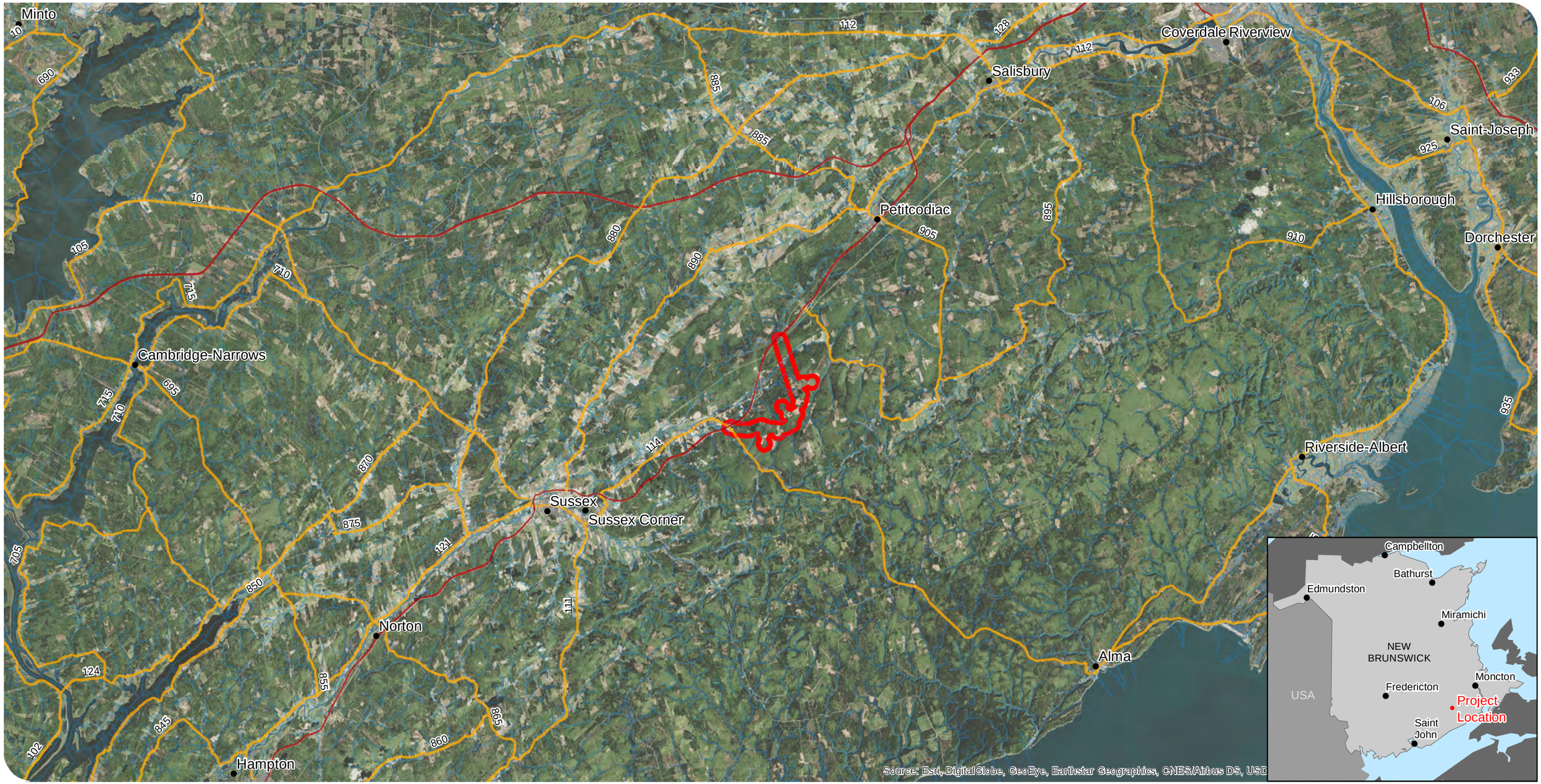
Though the terrestrial environment generally includes vegetation, wetlands, wildlife, wildlife habitat, and species at risk/species of conservation concern, the focus of this report is on rare plants and baseline vegetation. Separate reports will be provided for other components of the terrestrial environment, specifically for bats, birds, wildlife and wildlife habitat, and wetlands and watercourses.

1.1 Project Description

The proposed 20-40 megawatt (MW) Wocawson energy project is expected to provide electricity to approximately 3,600 – 7,200 New Brunswick homes. The turbines for the proposed project are sited on approximately 1,150 hectares (ha) of Crown land located approximately 20 km east of the Town of Sussex, in Kings County, New Brunswick (refer to **Figure 1**). The transmission line associated with the Project will extend across Crown land as well as private land to connect to the existing power grid.

The project area includes 12 proposed turbine locations (with 6-12 turbines installed), connector lines, a substation and transmission line, as well as pre-existing road infrastructure (Mitton Road) to be upgraded for the project (refer to **Figure 2**). Mitton Road (located off NB Route 114) is the main access to the project area.

Although the developed project is anticipated to only include 6 turbines, locations for 12 turbines were assessed to allow WLP the opportunity to refine the project footprint based on environmental constraints and to plan for future growth.



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Wocawson Energy Project

Wocawson Energy Project Location
FIGURE 1

Project Location
Watercourses

Road Network
Expressway / Highway
Freeway
Local / Street

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MAP DRAWING INFORMATION:
DATA PROVIDED BY NBDERD

MAP CREATED BY: JNH
MAP CHECKED BY: AS
MAP PROJECTION: NAD 1983 CSRS New Brunswick Stereographic

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SCALE 1:300,000

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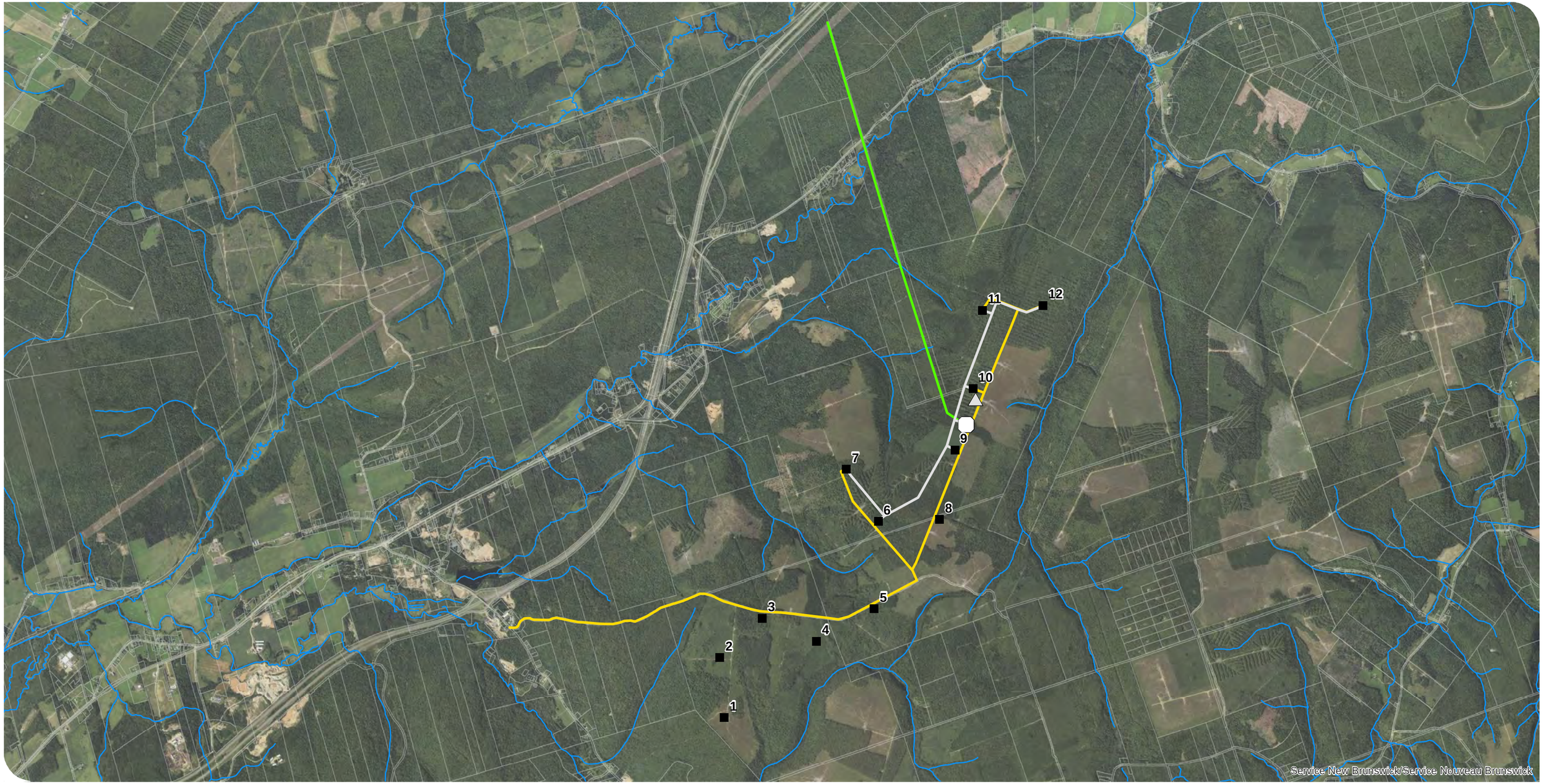
PROJECT: 18-6975 STATUS: FINAL DATE: 2018-08-02



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Wocawson Energy Project

Wocawson Energy Project Site Plan
FIGURE 2

Proposed Turbine Locations
Proposed Substation
Met Tower
Proposed Road Upgrade
Proposed Transmission Line
Watercourses
Proposed Collector
PID

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MAP DRAWING INFORMATION:
DATA PROVIDED BY NBDERD

MAP CREATED BY: JNH
MAP CHECKED BY: ACS
MAP PROJECTION: NAD 1983 CSRS New Brunswick Stereographic

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SCALE 1:45,000

FILE LOCATION: G:\CAD\GIS\186975_SUSSEX EAST\SUSSEX EAST WIND PROJECT\MAPS FOR REPORT\SITE PLAN JULY 9 2018_JNH

PROJECT: 18-6975 STATUS: FINAL DATE: 2018-08-02

The proposed turbine layout includes the sites for up to 12 turbines located along a ridge running approximately northeast-southwest between elevations 225 m and 275 m above mean sea level (amsl). The general project area is recognized to have an energetic wind regime particularly due to its high elevation (Natural Forces, 2018). Local topography is undulating, with several low ridges also following a northeast-southwest orientation.

The majority of the proposed project site is characterized as being predominantly in an early stage of forest regeneration or plantation due to historic and recent commercial forestry operations. Many of the turbine locations have been selected in areas of recent cut over (i.e., clear-cut and select-cut areas) to minimize the destruction of potentially undisturbed or more mature habitat. No mapped or unmapped watercourses or wetlands were observed within the proposed turbine locations.

The proposed transmission line runs approximately north-south and crosses a variety of land uses such as gravel pits, rural residential property, recent clear cuts, and areas of immature to mature coniferous and deciduous forests in various stages of regeneration. The northern portion of the proposed transmission line crosses three mapped watercourses and one unmapped watercourse. The proposed transmission line does not cross any mapped (regulated) wetlands, however; the proposed transmission line crosses an unregulated wetland (as presented on the Service New Brunswick [SNB] draft beta wetland mapping) located in low lying floodplain (riparian) habitat associated with the Kennebecasis River, as well as two unmapped wetlands.

To facilitate the existing forestry operations, several logging roads have been constructed and maintained across the area. WLP has selected the proposed project site to utilize existing roads reducing the need for new road construction. Additionally, several groomed snowmobile trails that pass through the proposed project area are frequently used during the winter months. WLP recognizes that the local snowmobile club is a concerned stakeholder and has selected the proposed locations for site infrastructure such that project activities are not anticipated to affect the snowmobile trails or require the construction of new trails.

1.1.1 Siting Considerations

WLP has extensive knowledge with respect to the development of wind farms on lands with favourable characteristics to provide efficient renewable energy. Many considerations are taken into account during site selection that focus on efficiently delivering renewable energy to the local community in a way that minimizes the effects on the community and the environment (Natural Forces, 2018).

Specifically, the proposed project area is favourable due to the following characteristics (in no particular order): the available wind resource, the project distance from residential dwellings and environmentally sensitive features, proximity to the New Brunswick Power (NB Power) transmission system, and the existing land use and disturbed nature of the area due to extensive forestry activities (Natural Forces, 2018). The following is a list of factors that have been considered during the site selection and design process:

Technical Considerations:

- Sufficient wind resource;
- Regional topography;
- Proximity to transmission system; and,
- Turbine technology.

Environmental Considerations:

- Proximity to provincially regulated wetlands;
- Proximity to residential dwellings or other sensitive buildings;
- Sensitivity of flora & fauna;
- Proximity to provincial or national parks and nature reserves; and,
- Risk of archaeological resource disturbance.

Land use considerations:

- Known culturally significant areas;
- Current land use;
- Historical land use;
- Future land use;
- Available access to the land; and,
- Proximity to residential properties, communities and towns.

1.1.2 Physical Components of the Project

The proposed project will be comprised of 6-12 Enercon wind energy generators, each with a rated capacity of 3.33 MW and a maximum hub height of 135 m and blade length of 72 m (exact model not yet determined). Refer to **Figure 3** for a conceptual rendering of the proposed turbine design.

The transmission line will extend approximately 5.6 km across privately owned lands, within a cleared corridor approximately 75 m wide, and will connect with existing New Brunswick Power infrastructure along the New Brunswick Department of Transportation and Infrastructure (NBDTI) right-of-way for Route 1. The proposed project's output at the point of interconnection to the electrical grid will be 20 - 40 MW.

The project's lifespan ('design life') is expected to be 30-years (which is unique to Enercon wind turbines) (Natural Forces, 2018). The 30-year design life allows the Project to align itself with a 30-year Power Purchase Agreement (PPA) with NB Power, and allow a longer, stable energy production. Natural Forces has used Enercon machines exclusively for all its community wind projects currently under operation and has a long-standing relationship with the company.

Figure 3: Anticipated Turbine Hub and Blade Lengths

Base photo reference: Enercon https://www.enercon.de/en/products/ep-4/e-141-ep4/

1.1.3 Project Schedule

The proposed project schedule and activities are currently arranged as four distinct phases, as described in **Table 1**, below:

Table 1: Anticipated Project Schedule

Phase	Phase Details	Anticipated Schedule
1. Development Phase	This phase includes the post power purchase agreement development activities (including the EIA and related work).	Q4 2017 to Q1 2019
2. Pre-Construction Phase	This phase includes pre-construction activities, including: financing arrangement for debt and equity, wind turbine supply negotiation, site design, execution of the Facilities Study Agreement, tendering for all construction contracts, and final construction-related permitting.	Q4 2018 to Q2 2019
3. Construction Phase	This phase includes construction and commissioning related activities, including: tree clearing and grubbing, road building, electrical works, foundation pour, turbine delivery, turbine assembly, and final Project commissioning.	Q1 2019 to Q4 2019 Commercial Operation anticipated to begin Q4 2019
4. Operation Phase	This phase includes activities that occur during the operation of the wind project, including: post-construction monitoring, annual monitoring reports, remote monitoring of turbine performance, and maintenance.	Q4 2019 to decommissioning of the turbines (30 year lifespan)

The decommissioning phase of the project will include activities required to decommission the wind project, including: the removal of the turbine materials and associated infrastructure to an appropriate underground depth and restoration of the site. The precise timing of the decommissioning of the proposed project is currently unknown. If possible, the wind turbines' lifespan may be extended by replacing parts or otherwise refurbishing them to produce additional energy after their original 30-year lifespan. Therefore, the decommissioning phase of the project is not considered within the scope of this assessment. Once the proposed project is approaching the end of its useful life, a decommissioning plan will be submitted to the New Brunswick Department of Environment and Local Government (NBDELG) prior to undertaking decommissioning activities that reflects the guidance and regulations in place at that time.

2.0 Vegetation Survey Scope and Methodology

This section details the scope of assessment of vegetation within the proposed project area and the methods that were used to conduct the surveys. The primary focus of the vegetation assessment was to identify the potential occurrence of species at risk (listed on the *Species at Risk Act* [*SARA*], by the Committee on the Status of Endangered Wildlife in Canada [COSEWIC], or on the New Brunswick *Species at Risk Act* [NB *SARA*]) or Species of Conservation Concern (SOCC) (listed as S1 or S2 by the Atlantic Canada Conservation Data Centre [AC CDC]).

2.1 Scope of Work

2.1.1 Survey Protocols

Under the New Brunswick *Environmental Impact Assessment Regulation* 87-83 (EIA Regulation) under the *Clean Environment Act,* areas of sensitive habitat and legally listed species at risk (SAR) should be avoided to the extent possible. As such, to better understand the types and quality of habitat in the area of the proposed project, a baseline study of available vegetation and vegetation communities is required to be conducted within the proposed project area. This assessment can identify the potential for occurrences of vegetation species at risk or of conservation concern within the location of the proposed project.

The New Brunswick "Guide to Environmental Impact Assessment in New Brunswick" (NBDELG, 2018) requires that physical and natural features of the land be described. In relation to the terrestrial environment, the guide includes the following features:

- Existing vegetation;
- Any known presence of species at risk; and
- Any known presence of critical or sensitive habitat.

Furthermore, the NBDELG's "Additional Information Requirements for Wind Turbines" sector guideline (NBDELG, 2004) requires that a description of vegetation (including the components above) be obtained at and surrounding each turbine site.

The vegetation present within the proposed project area was also surveyed from a traditional knowledge perspective by a member of Tobique First Nation (TFN) who accompanied Dillon's biologists during the field surveys.

2.1.2 Scope of Work

The scope of work for the vegetation assessment is based upon an understanding of the nature of the proposed project and project area, as well as Dillon's experience in assessing similar landscapes. For the purposes of this report and in support of a future EIA registration for the project, the vegetation assessment includes the following:

- **Vegetation Identification** – includes an assessment of identified vegetation species along with their regional rarity ranking that have the potential to be affected by the Project activities;
- **Species at Risk and Species of Conservation Concern** – includes those species listed by the federal and provincial authorities as well as regionally sensitive by the Atlantic Canada Conservation Data Centre (AC CDC); and
- **Vegetation of Cultural or Traditional Importance** – includes vegetation species identified by a member of TFN as culturally significant from a traditional knowledge/use perspective.

Vegetation and Vegetation Communities was selected as a valued component (VC) related to the proposed project due to the possible environmental effects of:

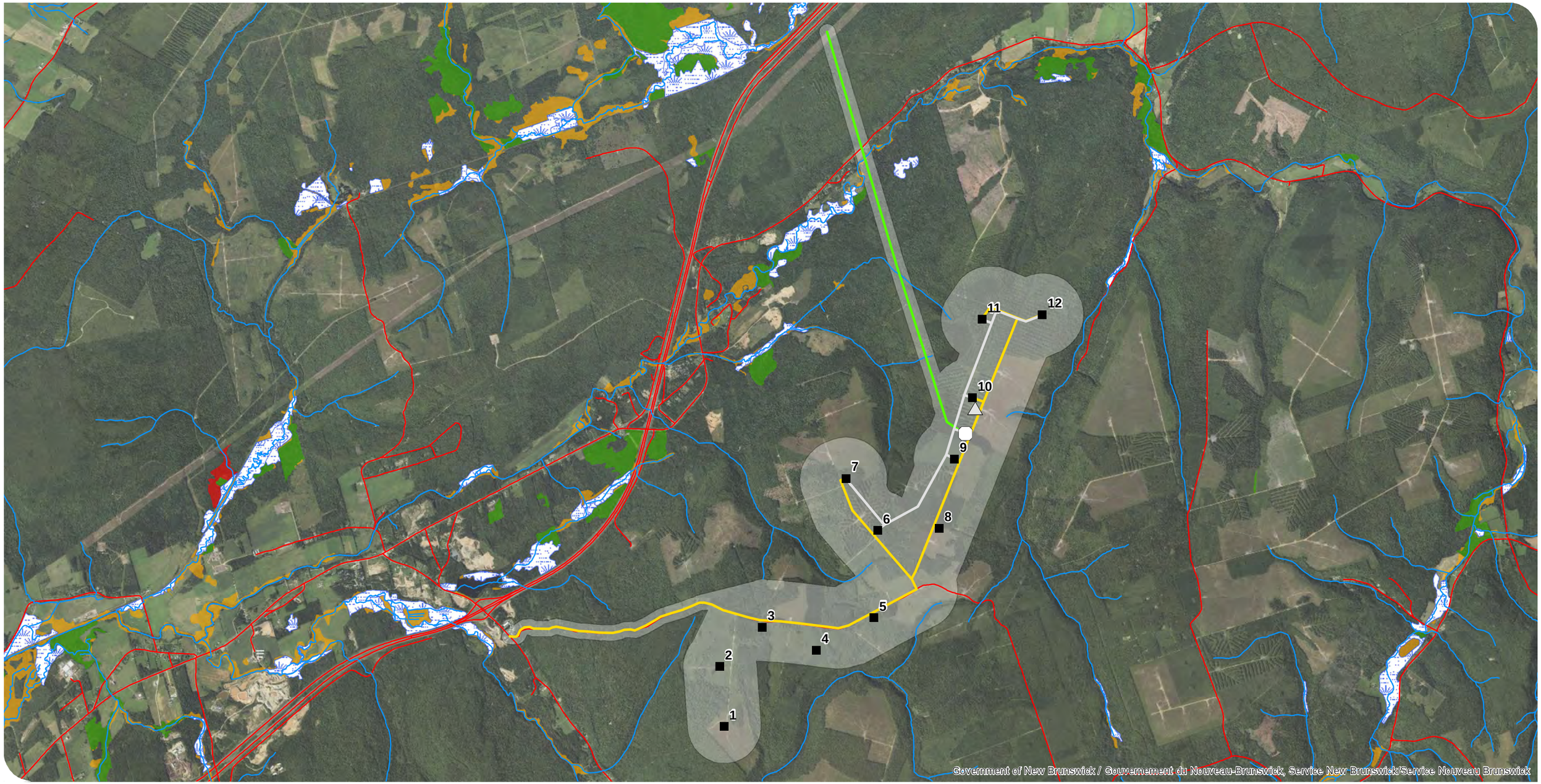
- A potential change or alteration of, disruption to, or removal of vegetation and vegetation communities as a result of the proposed project activities; and
- Effects to species identified as SOCC by the AC CDC or listed as SAR under COSEWIC, the federal *SARA* and/or the NB *SARA*.

2.1.3 Spatial Boundaries

For the purpose of this assessment, the spatial boundaries (i.e., the assessment area) have been identified as the area encompassing the access roads, each turbine location (plus a 150 m allowance surrounding each turbine), and the transmission line (plus 75 m allowance centered on the proposed line), extending to the existing power infrastructure. Refer to **Figure 4**.

2.1.4 Temporal Boundaries

The temporal boundaries for the assessment define the time periods for which likely environmental effects of the Project are considered. The temporal boundaries of this assessment include the duration of the construction phase (approximately 1 year in duration during 2019) and subsequent operation phase (approximately 30 years following construction) of the Project. In the construction phase, specific construction-related effects are anticipated to be short-term and limited to either the duration of the activities that produce the effects or the duration of the construction phase. Effects associated with the operation phase are longer term, as the proposed Project is intended to be operational for at least 30 years (although the lifespan may be extended with routine maintenance or refurbishment as appropriate).



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Wocawson Energy Project

Wocawson Energy
Project Assessment Area
FIGURE 4

- Proposed Turbine Locations
- Proposed Substation
- Met Tower
- Proposed Collector
- Proposed Road Upgrade
- Proposed Transmission Line
- Roads
- Watercourses
- Regulated Wetlands
- Assessment Area

NBDELG Draft Beta Wetland Mapping (unregulated)

- Provincially Significant Wetlands
- Intermediate Wetlands
- Forested Wetlands

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MAP DRAWING INFORMATION:
DATA PROVIDED BY NBDERD

MAP CREATED BY: SCN
MAP CHECKED BY: ACS
MAP PROJECTION: NAD 1983 CSRS New Brunswick Stereographic

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JULY 9 2018_JNH

PROJECT: 18-6975 STATUS: FINAL DATE: 2018-08-02

2.2 Methodology

2.2.1 Desktop Analysis Methods and Sources

Prior to completing the vegetation field surveys, Dillon reviewed readily available information from reputable sources. The information was reviewed to evaluate the potential for SOCC and/or SAR within the general area of the proposed project and to assist in scoping the field programs. The information was reviewed, along with information on habitats present in the general area of the proposed project to determine preliminary potential for at risk vegetation species. Dillon completed a review of the following sources and data lists prior to completing the field surveys:

- AC CDC;
- New Brunswick Department of Energy and Resource Development (NBDERD);
- The federal Species at Risk Registry;
- COSEWIC;
- Publicly-available GIS map layers (e.g. ecological land classification, forest and non-forest inventory, wetland inventory);
- High resolution aerial photography;
- Environmentally Significant Areas database; and,
- Ecological Reserves in the Maritimes.

2.2.2 Field Survey Methods

Field studies of vegetation species were conducted by the Dillon botanist, a field assistant, and a member of the Tobique First Nation between June 26, 2018 and July 6, 2018, in concert with other targeted field surveys (i.e., wetlands, watercourses, and wildlife and wildlife habitat). The survey area for the field studies was focused on the assessment area for the project as defined in Section 2.1.3 above) plus a 150 m allowance around the proposed turbine locations, a 75 m allowance along the proposed transmission line, and road upgrades.

Dillon recorded vegetation observation and areas of potential unique or pristine vegetation communities within the survey area. Characterization of forest habitat was assessed and is reported separately under the “Wildlife and Wildlife Habitat” report (Dillon, 2018).

3.0 Vegetation Survey Results

As described in the "Wildlife and Wildlife Habitat" Report (Dillon, 2018), the proposed project area is located within the Valley Lowlands Ecoregion, and specifically within the Anagance Ecodistrict that brackets the low-lying Kingston Ecosdistrict which is characterized by rugged and bi-partitioned terrain where the landscape is dominated by steep river valleys and ridgetops.

The majority of the proposed project is located within an area that has been extensively used for forestry practices and is dominated by formerly harvested areas (clear-cuts or strip-cuts) that are now in different stages of natural regeneration, or plantations (refer to the "Wildlife and Wildlife Habitat" report [Dillon, 2018]). The proposed transmission line extends through several habitat types, including areas of relatively mature hardwood and softwood forest stands, as well as wetlands and watercourses (refer to the "Wetlands and Watercourse" [Dillon, 2018] summary report for descriptions of the aquatic habitats and wetland vegetation present within the assessment area). The vegetation observations made during the field studies within the assessment area are summarized within the following sections.

3.1 Vegetation within the Assessment Area

A total of 149 vegetation species were observed within the assessment area during the field studies and identified as native species to New Brunswick with no identified non-native or exotic (SE) species identified. Refer to **Appendix A** for the complete list of all plant species within the study area. A total of 125 vegetation species (84%) were identified as being S4 to S5 according to the AC CDC S-ranks (AC CDC, 2017) (meaning they are common to widespread), 14 species (9%) identified as SNA (i.e., Not Applicable, because the species is not a suitable target for conservation activities), 9 species (6%) could not be definitively identified to species (i.e., identified to genus only), and 1 (0.7%) species identified as S2S3 (i.e., rare/uncommon). This species has been identified as an SOCC, and is discussed further in **Section 3.1.1**. No SAR were identified during the field survey.

3.1.1 Vegetation Species of Conservation Concern

According to the AC CDC records review (AC CDC, 2018), there are no records of vegetation SOCC or location sensitive species that have been historically observed within 5 km of the proposed project area.

During the field assessments, one SOCC was identified by the Dillon botanist: herb-Robert (*Geranium robertianum*) (S2S3) (pictured right). Herb-Robert is normally found along rocky woods and wet ledges (Hinds, 2000) and was observed along similar type of habitat along the Kennebecasis River floodplain located approximately 70 m east of the

transmission centreline, within the assessment area but outside the cleared transmission line corridor. Refer to **Figure 5** for the observed location.

Due to its observed location in relation to the proposed project components (i.e., outside the likely cleared portion of the transmission line corridor), it is not anticipated that this species has the potential to be adversely affected by the project activities.

3.1.2 Vegetation Species at Risk

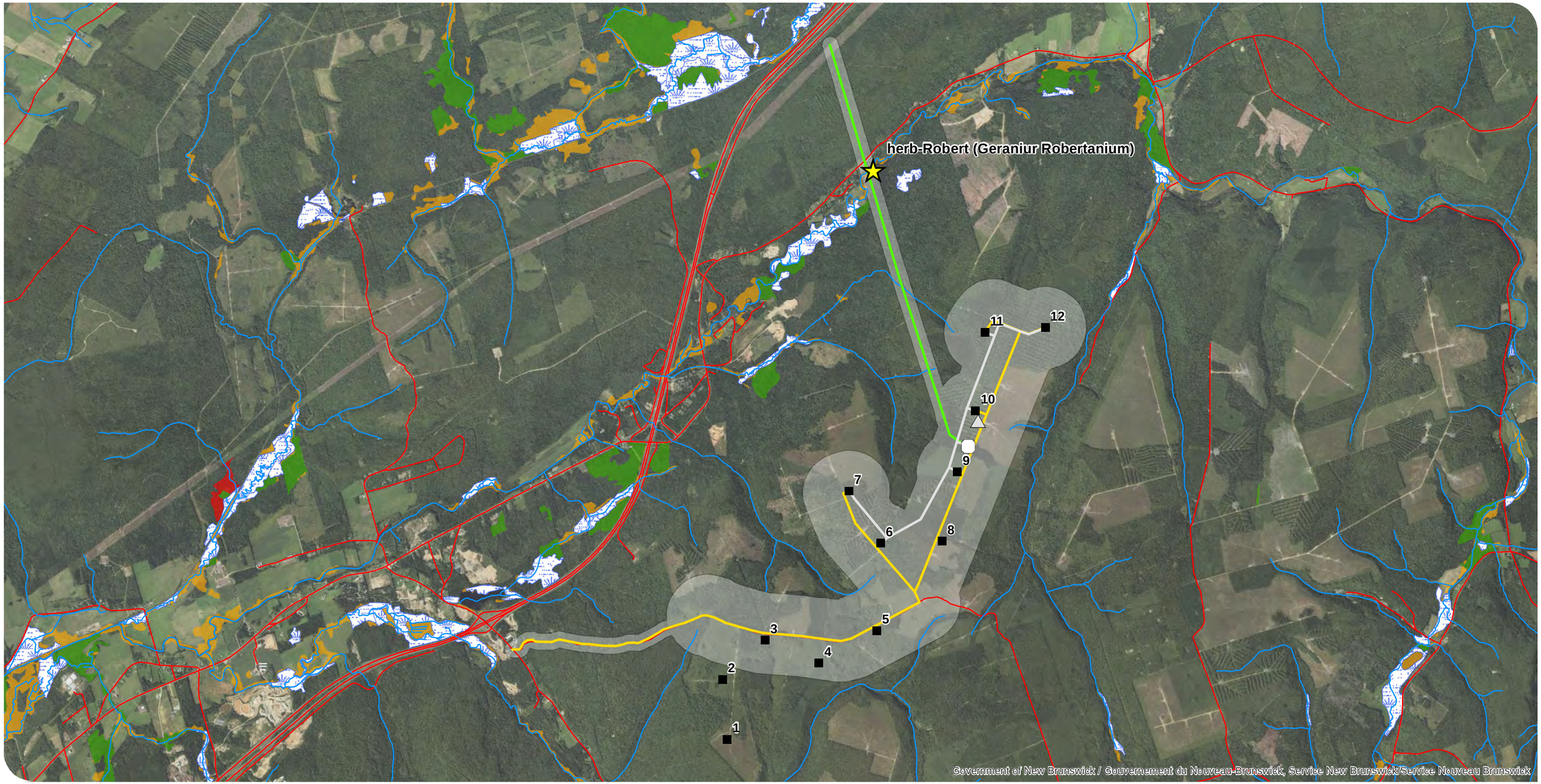
According to the AC CDC records review (AC CDC, 2018), there are no records of vegetation SAR that have been historically observed within 5 km of the proposed project area. No vegetation SAR were observed during the field surveys.

3.2 Vegetation – Traditional Knowledge/Use Perspective

The vegetation present within the proposed project area was surveyed from a traditional knowledge/use perspective by a member of Tobique First Nation (TFN) who accompanied Dillon's biologists during the field surveys. During the surveys, Indian cucumber-root (*Medeola virginiana*) (pictured right, which is traditionally used in medicines) and goldthread (*Captis trifolia*) (also traditionally used in medicines) were identified throughout the project area. While both of these species are culturally significant, they are commonly found across the province and the habitat provided in the proposed project area is not unique or sensitive for these species. No other plants of cultural importance to First Nations were identified during the field surveys.

Additionally, during the open house information sessions, several people knowledgeable of the local history indicated that in the late 1800's, First Nations people would travel to the area to harvest blueberries that would then be sold to local communities. The harvest area would alternate between the proposed project area and another nearby hillside, with the areas being burnt on the alternate years after harvesting had been completed.

This report focuses on understory vegetation and rare plants only. For details surrounding other traditional uses (based on interviews and knowledge of the TFN team member) within the proposed project area, refer to the summary report for wildlife and wildlife habitat, or wetlands and watercourses.



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Wocawson Energy Wind Project

Wocawson Energy Project Species of Conservation Concern Location
FIGURE 5

- Proposed Turbine Locations
- Proposed Substation
- Met Tower
- Identification of Plant Species of Conservation Concern (herb-Robert)
- Proposed Road Upgrade
- Proposed Collector
- Proposed Transmission Line
- Watercourses
- Roads
- Assessment Area
- Regulated Wetlands

NBDELG Draft Beta Wetland Mapping (unregulated)

- Provincially Significant Wetlands
- Intermediate Wetlands
- Forested Wetlands

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MAP DRAWING INFORMATION:
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PROJECT: 18-6975 STATUS: FINAL DATE: 2018-08-02

4.0 Assessment of Potential Environmental Interactions

The identification of potential interactions between the Project and vegetation communities has been undertaken in consideration of the nature of the Project, its planned activities, as well as potential accidental events/malfunctions.

4.1 Identification of Project Interactions

4.1.1 Approach to Project Components and Project Interaction Matrix

As presented in Section 1.1.3, this assessment recognizes four main distinct Project phases. The potential interactions with the surrounding environment have been considered in terms of each distinct phase. Additionally, accidents and malfunctions will be considered.

The phases of the Project include:

1. *Development Phase;*
2. *Pre-Construction Phase;*
3. *Construction Phase; and,*
4. *Operation Phase.*

This initial screening (i.e., project interaction matrix) assists in determining if an interaction between the activities being carried out in each phase of the proposed project and the valued component is possible. The matrix is presented below in **Table 2**.

Table 2: Project Interaction with Environmental Components

Valued Component	Project Phases				
	Development Phase	Pre-Construction Phase	Construction Phase	Operational Phase	Accidents and Malfunctions
Vegetation			✓		✓

Legend: ✓ = Potential interaction identified

Those project phases for which a checkmark is provided indicates that the project may interact with the VC, and thus an environmental effects assessment is warranted in Section 4.2 below.

Those project phases for which no interaction was noted with the VC (namely the development, pre-construction, and operational phases) are not carried forward or discussed further in this report. Vegetation will not interact with the development and pre-construction phases of the proposed project due to the conceptual, planning, administrative, and design nature of these phases. Since there are no

"on the ground" activities associated with these phases, no environmental effects are expected to result and therefore no interaction is anticipated. Though effects on vegetation will persist through the operation phase until the end of the project life, those effects on vegetation are the same as would have occurred during the construction phase, and in the interests of not double-counting the same effect during two phases, no new interaction is therefore expected during the operation phase.

As described in Section 1.1.3, the decommissioning phase of the project is not considered within the scope of this assessment; a decommissioning plan will be completed prior to this phase of the project that reflects the guidance and regulations of the time.

4.2 Assessment of Residual Environmental Effects

4.2.1 Identification of Potential Environmental Effects

Without mitigation, the proposed project could interact with vegetation and cause environmental effects in the following ways:

- Site preparation and clearing activities will result in the removal of vegetation which could lead to loss of habitat or increased erosion rates; and
- A spill or fire could occur as an accident or unplanned event which could lead to the loss of vegetation.

4.2.2 Standard Mitigation of Potential Environmental Effects

Mitigation is identified for each interaction and/or effect in relation to the terrestrial environment in an attempt to prevent the interaction from occurring if possible, or to reduce the severity, magnitude, geographic extent, frequency, or duration of the interaction. Best management practices (based on industry guidelines and regulatory guidance documents) have been identified as appropriate mitigative measures. In addition, several acts, codes, regulations and guidelines may require appropriate actions be conducted as mitigative measures prior to or during the interaction.

The federal and provincial legislation and codes that could apply to the proposed Project include (but may not be limited to):

- *Canadian Environmental Protection Act* and regulations;
- *Species at Risk Act*;
- The *Federal Policy on Wetland Conservation*;
- *Transportation of Dangerous Goods Act*, and regulations;
- New Brunswick *Clean Environment Act*, and regulations;
- New Brunswick *Clean Water Act*, and regulations;
- New Brunswick *Clean Air Act*, and regulations;

- New Brunswick *Occupational Health and Safety Act*, and regulations; and,
- New Brunswick *Species at Risk Act* and regulations.

The following standard mitigation measures have been identified to reduce the likelihood of occurrence, or minimize potential extent of effects of the proposed project on vegetation. Planned standard mitigation measures for the proposed project include the following:

- The area of disturbance associated with the development of the physical components of the proposed project (e.g., turbines, transmission line) will be minimized to the extent possible to limit the associated environmental effects associated with such disturbance;
- The Contractor will ensure that there is basic fire-fighting equipment available on-site and all personnel will be familiar with the equipment and equipment location the event of an accidental fire;
- Existing access roads will be utilized where possible to reduce the loss of wildlife habitat;
- Rubbish and waste materials will be kept at minimum quantities and burning of this material will be prohibited;
- The contractor will be required to provide spill response training to construction personnel and will ensure that spill response equipment is readily available on-site, and each piece of machinery is equipped with a spill response kit; and,
- Remedial action, or engineered controls, for any spills or leaks that occur will be completed.

A list of mitigation measures related to specific phases of the project (as outlined in Section 1.1.3) is provided in **Table 3**.

4.2.3 Characterization of Residual Environmental Effects

Table 3 identifies the potential environmental effects that may occur to vegetation, identifies proposed mitigation, and discusses residual environmental effects after mitigation has been applied.

Table 3 - Potential Environmental Effects of the Proposed Project on Vegetation

Project Phase	Potential Environmental Effect	Mitigation	Characterization of Residual Environmental Effects	Anticipated Significance of Residual Environmental Effects
Vegetation and Rare Plants				
Construction Phase	• Clearing and grubbing of vegetation (habitat) during construction will cause a change in vegetation quality and/or quantity. • The Project footprint will cause loss of vegetation.	In addition to the standard mitigation measures provided in Section 4.2.2, the following mitigative measures will be employed to reduce the environmental effects to vegetation in the area of the Project prior to and during the construction phase of the project. • Vegetation will be retained where possible; • Existing access roads will be utilized where possible to reduce the loss of vegetation; • All workers will adhere to the *Species at Risk Act* ; and, • Disturbed areas not required for project operation will be revegetated using an approved seed mix as soon as feasible.	<u>Characterization of Residual Environmental Effects:</u> Magnitude: Low Spatial Extent: Immediate (limited to project site) Duration: Short term – Construction period (1 year) Frequency: Moderate Reversibility: Reversible <u>Overall Summary:</u> With the implementation of planned mitigation, interactions between the Project and vegetation during the construction phase of the Project are not expected to be substantive.	Not significant
Accidents, Malfunctions, and Unplanned Events	• There is a potential for unplanned releases related to any construction project. • There is a potential for loss of vegetation due to spills or fires.	In addition to the standard mitigation measures provided in Section 4.2.2, the following mitigative measures will be employed to reduce the environmental effects to vegetation in the area of the Project prior to and during the construction and operation phases of the project. • Any spills or leaks that occur will be reported to the appropriate regulatory authorities, if applicable, as soon as possible; • Remedial action, or engineered controls, for any spills or leaks that occur will be completed; • Refueling, oiling, and maintenance of equipment will be completed at least 30 m away from any watercourse, wetland, or well to minimize potential effects that could arise in the event of a spill; • Major servicing of equipment will be completed off-site by a licensed mechanic when possible; • Chemicals and petroleum hydrocarbons will be stored in appropriate containers and in specifically designated areas. Where applicable, secondary containment of chemicals or petroleum hydrocarbons will be employed; • Work entailing use of toxic or hazardous materials, chemicals, or otherwise creating hazard to life, safety of health, will be conducted in accordance with National Fire Code of Canada to minimize the potential for spills or fires; and, • An Emergency Spill Response Plan will be developed and communicated to all personnel onsite.	<u>Characterization of Residual Environmental Effects:</u> Magnitude: Low Spatial Extent: Immediate (limited to project site) Duration: Short term Frequency: Low Reversibility: Reversible <u>Overall Summary:</u> With the implementation of planned mitigation, and with the careful development and implementation of contingency and emergency response plans to be applied in the unlikely occurrence of an accident, malfunction, or unplanned event, interactions between the Project and vegetation arising from an accidental event during construction and operation are not expected to be substantive.	Not significant

Note: As noted within section 4.1.1, the Decommissioning Phase of the proposed project is not included within the scope of this assessment.

Any residual effects on vegetation that may occur as a result of the construction phase of the project are expected to be of low magnitude and be reversible in nature. The spatial extent of potential residual effects is also anticipated to be limited to the project site, and limited to the construction period of 1 year. Therefore, any potential residual effects on vegetation are not expected to be substantive.

With the implementation of planned mitigation, and with the careful development and implementation of contingency and emergency response plans to be applied, impacts posed by accidents and unplanned events related to the Project and vegetation are not expected to be substantive.

5.0 Summary and Conclusion

This report has been prepared for the construction and operation of the Wocawson Energy Project. The proposed project is expected to provide renewable electricity to approximately 3,600 – 7,200 New Brunswick homes and support New Brunswick Power in attaining their future renewable energy targets.

The information provided in this document is based on the current available design/planning information and existing environment information obtained during focused field surveys conducted in June and July 2018. The applicable environmental components and potential project environmental effects were assessed and presented with meaningful mitigation measures to minimize, and in some cases eliminate, the potential effects. Based on these interactions, it can be concluded that, with the proper mitigation and standard operating procedures as outlined in this document, the residual environmental effects of the project are anticipated to be not significant for the project phases.

6.0 Closure

This report was prepared by Dillon Consulting Limited (Dillon) on behalf of the Wocawson Energy Limited Partnership, in support of the Wocawson Energy Project EIA. Dillon has used the degree of care and skill ordinarily exercised under similar circumstances at the time the work was performed by reputable members of the environmental consulting profession practicing in Canada. Dillon assumes no responsibility for conditions which were beyond its scope of work. There is no warranty expressed or implied by Dillon.

The material in the report reflects Dillon's best judgment in light of the information available to Dillon at the time of preparation. Any use which a third party makes of this report, or any reliance on or decisions made based on it, are the responsibilities of such third parties. Dillon accepts no responsibility for damages, if any, suffered by any third party as a result of decisions made or actions based on this report.

Yours truly,

DILLON CONSULTING LIMITED

Kristin Banks, P.Eng.

Project Manager

Appendix A

Vegetation Data

Transmission Corridor (South of Portage Vale Rd)		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Abies balsamea	Balsam Fir	S5
Acer pensylvanicum	Striped Maple	S5
Acer rubrum	Red Maple	S5
Acer saccharum	Sugar Maple	S5
Acer spicatum	Mountain Maple	S5
Actaea pachypoda	White Baneberry	S4
Actaea rubra	Red Baneberry	S5
Alisma triviale	Northern Water Plantain	S5
Alnus incana	Speckled Alder	S5
Anaphalis margaritacea	Pearly Everlasting	S5
Aralia hispida	Bristly Sarsaparilla	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Arisaema triphyllum	Jack-in-the-pulpit	S5
Athyrium filix-femina	Common Lady Fern	S5
Betula alleghaniensis	Yellow Birch	S5
Betula papyrifera	Paper Birch	S5
Calamagrostis canadensis	Bluejoint Reed Grass	S5
Carex disperma	Two-seeded Sedge	S5
Carex echinata	Star Sedge	S5
Carex intumescens	Bladder Sedge	S5
Carex lurida	Sallow Sedge	S5
Carex trisperma	Three-seeded Sedge	S5
Chamerion angustifolium	Fireweed	S5
Chrysosplenium americanum	American Golden Saxifrage	S5
Circaea alpina	Small Enchanter's Nightshade	S5
Coptis trifolia	Goldthread	S5
Cornus alternifolia	Alternate-leaved Dogwood	S5
Cornus canadensis	Bunchberry	S5
Cypripedium acaule	Pink Lady's-Slipper	S5
Dennstaedtia punctilobula	Eastern Hay-Scented Fern	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Digitalis Spp.	Foxglove Species	N/A
Dryopteris carthusiana	Spinulose Wood Fern	S5
Dryopteris cristata	Crested Wood Fern	S5
Dryopteris intermedia	Evergreen Wood Fern	S5
Equisetum sylvaticum	Woodland Horsetail	S5
Eupatorium maculatum	Spotted Joe-pye-weed	S5
Eupatorium perfoliatum	Common Boneset	S5
Fagus grandifolia	American Beech	S4
Fragaria vesca	Woodland Strawberry	S4
Fragaria virginiana	Wild Strawberry	S5
Fraxinus americana	White Ash	S4S5
Galium mollugo	Smooth Bedstraw	SNA

Galium palustre	Common Marsh Bedstraw	S5
Gaultheria hispidula	Creeping Snowberry	S5
Gaultheria procumbens	Eastern Teaberry	S5
Geum canadense	White Avens	S5
Geum macrophyllum	Large-Leaved Avens	S5
Gymnocarpium dryopteris	Common Oak Fern	S5
Hamamelis virginiana	American Witch-Hazel	S4
Hieracium caespitosum	Field Hawkweed	SNA
Hieracium pilosella	Mouse-ear Hawkweed	SNA
Impatiens capensis	Spotted Jewelweed	S5
Juncus effusus	Soft Rush	S5
Kalmia angustifolia	Sheep Laurel	S5
Linnaea borealis	Twinflower	S5
Lonicera canadensis	Canada Fly Honeysuckle	S5
luzula acuminata	Hairy Woodrush	S5
Lycopodium annotinum	Stiff Clubmoss	S5
Lycopodium clavatum	Running Clubmoss	S5
Maianthemum canadense	Wild Lily-of-The-Valley	S5
Medeola virginiana	Indian Cucumber Root	S5
Melampyrum lineare	American Cow Wheat	S5
Mimulus moschatus	Musk Monkeyflower	SNA
Monotropa uniflora	Indian Pipe	S5
Oclemena acuminata	Whorled Wood Aster	S5
Onoclea sensibilis	Sensitive Fern	S5
Osmunda claytoniana	Interrupted Fern	S5
Oxalis montana	Common Wood Sorrel	S5
Packera aurea	Golden Groundsel	S4S5
Phegopteris connectilis	Northern Beech Fern	S5
Picea rubens	Red Spruce	S5
Pinus banksiana	Jack Pine	S5
Pinus strobus	Eastern White Pine	S5
Polygonum cilinode	Fringed Black Bindweed	S5
Populus grandidentata	Large-toothed Aspen	S5
Prenanthes trifoliolata	Three-leaved Rattlesnakeroot	S5
Prunella vulgaris	Common Self-heal	S5
Prunus Spp.	Plum Species	N/A
Pteridium aquilinum	Bracken Fern	S5
Ribes Spp.	Currant Species	N/A
Rubus hispidus	Bristly Dewberry	S5
Rubus idaeus	Red Raspberry	S5
Sambucus nigra ssp. canadensis	Black Elderberry	S5
Scirpus microcarpus	Small-fruited Bulrush	S5
Scutellaria lateriflora	Mad-dog Skullcap	S5
Solidago rugosa	Rough-stemmed Goldenrod	S5
Solidago Spp.	Goldenrod Species	N/A
Sorbus americana	American Mountain Ash	S5
Streptopus lanceolatus	Rose Twisted-stalk	S5

Thalictrum pubescens	Tall Meadow-Rue	S5
Thelypteris noveboracensis	New York Fern	S5
Thuja occidentalis	Eastern White Cedar	S5
Trientalis borealis	Northern Starflower	S5
Trillium erectum	Red Trillium	S5
Trillium undulatum	Painted Trillium	S5
Tsuga canadensis	Eastern Hemlock	S5
Urtica dioica	Stinging Nettle	S4
Vaccinium angustifolium	Late Lowbush Blueberry	S5
Vaccinium myrtilloides	Velvet-leaved Blueberry	S5
Veronica officinalis	Common Speedwell	S5
Veronica serpyllifolia	Thyme-Leaved Speedwell	SNA
Viburnum lantanoides	Hobblebush	S5
Viola Spp.	Violet Species	N/A

Transmission Corridor (North of Portage Vale Road)		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Acer rubrum	Red Maple	S5
Alnus incana	Speckled Alder	S5
Anaphalis margaritacea	Pearly Everlasting	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Arenaria serpyllifolia	Thyme-leaved Sandwort	SNA
Arisaema triphyllum	Jack-in-the-pulpit	S5
Betula populifolia	Gray Birch	S5
Carex echinata	Star Sedge	S5
Carex lurida	Sallow Sedge	S5
Carex projecta	Necklace Sedge	S5
Carex scoparia	Broom Sedge	S5
Chimaphila umbellata	Common Pipsissewa	S5
Cornus canadensis	Bunchberry	S5
Cornus sericea	Red Osier Dogwood	S5
Corylus cornuta	Beaked Hazel	S5
Crataegus spp.	Hawthorn Species	N/A
Cypripedium acaule	Pink Lady's-Slipper	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Dryopteris carthusiana	Spinulose Wood Fern	S5
Dryopteris carthusiana	Spinulose Wood Fern	S5
Dryopteris intermedia	Evergreen Wood Fern	S5
Echinocystis lobata	Wild Cucumber	S5
Eupatorium maculatum	Spotted Joe-pye-weed	S5
Eupatorium perfoliatum	Common Boneset	S5
Euthamia graminifolia	Grass-leaved Goldenrod	S5
Fragaria vesca	Woodland Strawberry	S4
Fragaria virginiana	Wild Strawberry	S5
Fragaria virginiana	Wild Strawberry	S5
Galium asprellum	Rough Bedstraw	S5
Galium palustre	Common Marsh Bedstraw	S5
Galium verum	Yellow Bedstraw	SNA
Geranium robertianum	Herb Robert	S2S3
Geum aleppicum	Yellow Avens	S5
Geum canadense	White Avens	S5
Glyceria grandis	Common Tall Manna Grass	S5
Glyceria laxa	Northern Mannagrass	S4?
Glyceria melicaria	Slender Manna Grass	S5
Hieracium aurantiacum	Orange Hawkweed	SNA
Hieracium caespitosum	Field Hawkweed	SNA
Hieracium pilosella	Mouse-ear Hawkweed	SNA
Juncus effusus	Soft Rush	S5
Kalmia angustifolia	Sheep Laurel	S5
Lysimachia terrestris	Swamp Yellow Loosestrife	S5
Maianthemum canadense	Wild Lily-of-The-Valley	S5

Malus pumila	Common Apple	SNA
Medeola virginiana	Indian Cucumber Root	S5
Melampyrum lineare	American Cow Wheat	S5
Mentha arvensis	Wild Mint	S5
Myosotis laxa	Small Forget-Me-Not	S5
Oclemena acuminata	Whorled Wood Aster	S5
Oenothera perennis	Perennial Evening Primrose	S5
Onoclea sensibilis	Sensitive Fern	S5
Oryzopsis asperifolia	White-grained Mountain Rice	S5
Oxalis montana	Common Wood Sorrel	S5
Oxalis stricta	European Wood Sorrel	S5
Pastinaca sativa	Wild Parsnip	SNA
Picea glauca	White Spruce	S5
Picea glauca	White Spruce	S5
Pinus banksiana	Jack Pine	S5
Pinus strobus	Eastern White Pine	S5
Polygonum cilinode	Fringed Black Bindweed	S5
Polygonum hydropiperoides	False Waterpepper	S4
Populus tremuloides	Trembling Aspen	S5
Potentilla norvegica	Rough Cinquefoil	S5
Prenanthes trifoliolata	Three-leaved Rattlesnakeroot	S5
Prunus pensylvanica	Pin Cherry	S5
Prunus virginiana	Chokecherry	S5
Pteridium aquilinum	Bracken Fern	S5
Ranunculus acris	Common Buttercup	SNA
Ribes spp.	Currant Species	N/A
Rubus allegheniensis	Alleghaney Blackberry	S5
Rubus hispidus	Bristly Dewberry	S5
Rubus idaeus	Red Raspberry	S5
Salix spp.	Willow Species	N/A
Sambucus racemosa	Red Elderberry	S5
Scirpus cyperinus	Common Woolly Bulrush	S5
Scirpus microcarpus	Small-fruited Bulrush	S5
Scutellaria galericulata	Marsh Skullcap	S5
Scutellaria lateriflora	Mad-dog Skullcap	S5
Senecio jacobaea	Tansy Ragwort	SNA
Solanum dulcamara	Bittersweet Nightshade	SNA
Solidago rugosa	Rough-stemmed Goldenrod	S5
Streptopus lanceolatus	Rose Twisted-stalk	S5
Thalictrum pubescens	Tall Meadow-Rue	S5
Trientalis borealis	Northern Starflower	S5
Vaccinium angustifolium	Late Lowbush Blueberry	S5
Vaccinium myrtilloides	Velvet-leaved Blueberry	S5
Viola cucullata	Marsh Blue Violet	S5

Turbine #1		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Acer pensylvanicum	Striped Maple	S5
Acer rubrum	Red Maple	S5
Acer saccharum	Sugar Maple	S5
Amelanchier spp.	Serviceberry Species	N/A
Aralia hispida	Bristly Sarsaparilla	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Betula populifolia	Gray Birch	S5
Carex projecta	Necklace Sedge	S5
Chamerion angustifolium	Fireweed	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Dryopteris intermedia	Evergreen Wood Fern	S5
Dryopteris marginalis	Marginal Wood Fern	S5
Hieracium caespitosum	Field Hawkweed	SNA
Hieracium pilosella	Mouse-ear Hawkweed	SNA
Lonicera canadensis	Canada Fly Honeysuckle	S5
Maianthemum canadense	Wild Lily-of-The-Valley	S5
Medeola virginiana	Indian Cucumber Root	S5
Oclemena acuminata	Whorled Wood Aster	S5
Polygonum cilinode	Fringed Black Bindweed	S5
Potentilla norvegica	Rough Cinquefoil	S5
Prunus virginiana	Chokecherry	S5
Rhus typhina	Staghorn Sumac	S5
Rosa spp.	Rose Species	N/A
Rubus allegheniensis	Alleghaney Blackberry	S5
Rubus idaeus	Red Raspberry	S5
Sorbus americana	American Mountain Ash	S5
Streptopus lanceolatus	Rose Twisted-stalk	S5
Taraxacum officinale	Common Dandelion	SNA
Thelypteris noveboracensis	New York Fern	S5
Trientalis borealis	Northern Starflower	S5
Trillium undulatum	Painted Trillium	S5
Veronica officinalis	Common Speedwell	S5

Turbine #2		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Acer pensylvanicum	Striped Maple	S5
Acer rubrum	Red Maple	S5
Acer saccharum	Sugar Maple	S5
Aralia hispida	Bristly Sarsaparilla	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Betula alleghaniensis	Yellow Birch	S5
Betula populifolia	Gray Birch	S5
Carex projecta	Necklace Sedge	S5
Chamerion angustifolium	Fireweed	S5
Dennstaedtia punctilobula	Eastern Hay-Scented Fern	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Dryopteris carthusiana	Spinulose Wood Fern	S5
Dryopteris intermedia	Evergreen Wood Fern	S5
Fagus grandifolia	American Beech	S4
Fragaria virginiana	Wild Strawberry	S5
Hieracium caespitosum	Field Hawkweed	SNA
Hieracium pilosella	Mouse-ear Hawkweed	SNA
Lactuca biennis	Tall Blue Lettuce	S5
Leucanthemum vulgare	Oxeye Daisy	SNA
Lycopodium annotinum	Stiff Clubmoss	S5
Maianthemum canadense	Wild Lily-of-The-Valley	S5
Oclemena acuminata	Whorled Wood Aster	S5
Picea mariana	Black Spruce	S5
Polygonum cilinode	Fringed Black Bindweed	S5
Prunus virginiana	Chokecherry	S5
Rubus idaeus	Red Raspberry	S5
Rumex acetosella	Sheep Sorrel	SNA
Salix spp.	Willow Species	N/A
Solidago canadensis	Canada Goldenrod	S5
Solidago rugosa	Rough-stemmed Goldenrod	S5
Thelypteris noveboracensis	New York Fern	S5
Trientalis borealis	Northern Starflower	S5
Trillium undulatum	Painted Trillium	S5

Turbine #3		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Acer pensylvanicum	Striped Maple	S5
Acer rubrum	Red Maple	S5
Acer saccharum	Sugar Maple	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Betula papyrifera	Paper Birch	S5
Carex projecta	Necklace Sedge	S5
Chamerion angustifolium	Fireweed	S5
Dennstaedtia punctilobula	Eastern Hay-Scented Fern	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Dryopteris intermedia	Evergreen Wood Fern	S5
Dryopteris marginalis	Marginal Wood Fern	S5
Fagus grandifolia	American Beech	S4
Fragaria virginiana	Wild Strawberry	S5
Hieracium aurantiacum	Orange Hawkweed	SNA
Hieracium caespitosum	Field Hawkweed	SNA
Hieracium pilosella	Mouse-ear Hawkweed	SNA
Maianthemum canadense	Wild Lily-of-The-Valley	S5
Oclemena acuminata	Whorled Wood Aster	S5
Osmunda claytoniana	Interrupted Fern	S5
Polygonum cilinode	Fringed Black Bindweed	S5
Rosa spp.	Rose Species	N/A
Rubus idaeus	Red Raspberry	S5
Streptopus lanceolatus	Rose Twisted-stalk	S5
Trientalis borealis	Northern Starflower	S5

Turbine #4		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Aralia nudicaulis	Wild Sarsaparilla	S5
Betula papyrifera	Paper Birch	S5
Betula populifolia	Gray Birch	S5
Cornus canadensis	Bunchberry	S5
Cypripedium acaule	Pink Lady's-Slipper	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Dryopteris intermedia	Evergreen Wood Fern	S5
Epilobium ciliatum	Northern Willowherb	S5
Fragaria virginiana	Wild Strawberry	S5
Gaultheria procumbens	Eastern Teaberry	S5
Maianthemum canadense	Wild Lily-of-The-Valley	S5
Melampyrum lineare	American Cow Wheat	S5
Moneses uniflora	One-flowered Wintergreen	S5
Pteridium aquilinum	Bracken Fern	S5
Pyrola chlorantha	Green-flowered Pyrola	S4
Pyrola elliptica	Shinleaf	S5
Rubus allegheniensis	Alleghaney Blackberry	S5
Trientalis borealis	Northern Starflower	S5

Turbine #5		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Acer pensylvanicum	Striped Maple	S5
Acer rubrum	Red Maple	S5
Aralia hispida	Bristly Sarsaparilla	S5
Carex communis	Fibrous-Root Sedge	S5
Carex cumulata	Dense Sedge	S4S5
Carex projecta	Necklace Sedge	S5
Cornus canadensis	Bunchberry	S5
Gaultheria procumbens	Eastern Teaberry	S5
Hieracium caespitosum	Field Hawkweed	SNA
Kalmia angustifolia	Sheep Laurel	S5
Lactuca biennis	Tall Blue Lettuce	S5
Maianthemum canadense	Wild Lily-of-The-Valley	S5
Picea rubens	Red Spruce	S5
Polygonum cilinode	Fringed Black Bindweed	S5
Prunus virginiana	Chokecherry	S5
Pteridium aquilinum	Bracken Fern	S5
Salix spp.	Willow Species	N/A
Solidago canadensis	Canada Goldenrod	S5
Trientalis borealis	Northern Starflower	S5
Vaccinium myrtilloides	Velvet-leaved Blueberry	S5

Turbine #6		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Acer pensylvanicum	Striped Maple	S5
Acer rubrum	Red Maple	S5
Aralia hispida	Bristly Sarsaparilla	S5
Betula populifolia	Gray Birch	S5
Chamerion angustifolium	Fireweed	S5
Cornus canadensis	Bunchberry	S5
Cypripedium acaule	Pink Lady's-Slipper	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Lycopodium annotinum	Stiff Clubmoss	S5
Picea rubens	Red Spruce	S5
Populus tremuloides	Trembling Aspen	S5
Pteridium aquilinum	Bracken Fern	S5
Rubus hispidus	Bristly Dewberry	S5
Trientalis borealis	Northern Starflower	S5
Vaccinium myrtilloides	Velvet-leaved Blueberry	S5

Turbine #7		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Acer rubrum	Red Maple	S5
Aralia hispida	Bristly Sarsaparilla	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Chamerion angustifolium	Fireweed	S5
Cornus canadensis	Bunchberry	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Hieracium aurantiacum	Orange Hawkweed	SNA
Hieracium caespitosum	Field Hawkweed	SNA
Maianthemum canadense	Wild Lily-of-The-Valley	S5
Pinus banksiana	Jack Pine	S5
Pinus strobus	Eastern White Pine	S5
Polygonum cilinode	Fringed Black Bindweed	S5
Populus tremuloides	Trembling Aspen	S5
Rubus idaeus	Red Raspberry	S5
Trientalis borealis	Northern Starflower	S5
Vaccinium angustifolium	Late Lowbush Blueberry	S5

Turbine #8		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Acer pensylvanicum	Striped Maple	S5
Acer rubrum	Red Maple	S5
Amelanchier spp.	Serviceberry Species	N/A
Aralia hispida	Bristly Sarsaparilla	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Betula papyrifera	Paper Birch	S5
Betula populifolia	Gray Birch	S5
Chamerion angustifolium	Fireweed	S5
Cornus canadensis	Bunchberry	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Epilobium ciliatum	Northern Willowherb	S5
Fragaria virginiana	Wild Strawberry	S5
Gaultheria procumbens	Eastern Teaberry	S5
Kalmia angustifolia	Sheep Laurel	S5
Maianthemum canadense	Wild Lily-of-The-Valley	S5
Picea rubens	Red Spruce	S5
Pinus strobus	Eastern White Pine	S5
Populus tremuloides	Trembling Aspen	S5
Pteridium aquilinum	Bracken Fern	S5
Rubus allegheniensis	Alleghaney Blackberry	S5
Rubus idaeus	Red Raspberry	S5
Sisyrinchium montanum	Mountain Blue-eyed-grass	S5
Trientalis borealis	Northern Starflower	S5
Vaccinium angustifolium	Late Lowbush Blueberry	S5
Vaccinium myrtilloides	Velvet-leaved Blueberry	S5
Viburnum nudum	Northern Wild Raisin	S5

Turbine #9		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Acer pensylvanicum	Striped Maple	S5
Acer rubrum	Red Maple	S5
Anaphalis margaritacea	Pearly Everlasting	S5
Aralia hispida	Bristly Sarsaparilla	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Chamerion angustifolium	Fireweed	S5
Chimaphila umbellata	Common Pipsissewa	S5
Clintonia borealis	Yellow Bluebead Lily	S5
Comptonia peregrina	Sweet-fern	S5
Cornus canadensis	Bunchberry	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Doellingeria umbellata	Hairy Flat-top White Aster	S5
Dryopteris intermedia	Evergreen Wood Fern	S5
Fragaria virginiana	Wild Strawberry	S5
Gaultheria procumbens	Eastern Teaberry	S5
Hieracium caespitosum	Field Hawkweed	SNA
Kalmia angustifolia	Sheep Laurel	S5
Maianthemum canadense	Wild Lily-of-The-Valley	S5
Melampyrum lineare	American Cow Wheat	S5
Oclemena acuminata	Whorled Wood Aster	S5
Oryzopsis asperifolia	White-grained Mountain Rice	S5
Pinus strobus	Eastern White Pine	S5
Populus tremuloides	Trembling Aspen	S5
Prenanthes trifoliolata	Three-leaved Rattlesnakeroot	S5
Pyrola elliptica	Shinleaf	S5
Rubus idaeus	Red Raspberry	S5
Salix spp.	Willow Species	N/A
Spiraea alba	White Meadowsweet	S5
Trientalis borealis	Northern Starflower	S5
Vaccinium myrtilloides	Velvet-leaved Blueberry	S5
Viburnum nudum	Northern Wild Raisin	S5

Turbine #10		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Acer pensylvanicum	Striped Maple	S5
Acer rubrum	Red Maple	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Betula papyrifera	Paper Birch	S5
Chimaphila umbellata	Common Pipsissewa	S5
Clintonia borealis	Yellow Bluebead Lily	S5
Cornus canadensis	Bunchberry	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Fagus grandifolia	American Beech	S4
Gaultheria procumbens	Eastern Teaberry	S5
Hamamelis virginiana	American Witch-Hazel	S4
Kalmia angustifolia	Sheep Laurel	S5
Oclemena acuminata	Whorled Wood Aster	S5
Orthilia secunda	One-sided Wintergreen	S5
Picea rubens	Red Spruce	S5
Pinus banksiana	Jack Pine	S5
Pinus strobus	Eastern White Pine	S5
Pteridium aquilinum	Bracken Fern	S5
Pyrola elliptica	Shinleaf	S5
Streptopus lanceolatus	Rose Twisted-stalk	S5
Trientalis borealis	Northern Starflower	S5
Trillium undulatum	Painted Trillium	S5
Vaccinium myrtilloides	Velvet-leaved Blueberry	S5
Viburnum nudum	Northern Wild Raisin	S5

Turbine #11		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Acer rubrum	Red Maple	S5
Anaphalis margaritacea	Pearly Everlasting	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Betula populifolia	Gray Birch	S5
Cornus canadensis	Bunchberry	S5
Cypripedium acaule	Pink Lady's-Slipper	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Dryopteris carthusiana	Spinulose Wood Fern	S5
Dryopteris intermedia	Evergreen Wood Fern	S5
Euthamia graminifolia	Grass-leaved Goldenrod	S5
Fragaria vesca	Woodland Strawberry	S4
Fragaria virginiana	Wild Strawberry	S5
Hieracium pilosella	Mouse-ear Hawkweed	SNA
Kalmia angustifolia	Sheep Laurel	S5
Maianthemum canadense	Wild Lily-of-The-Valley	S5
Melampyrum lineare	American Cow Wheat	S5
Oclemena acuminata	Whorled Wood Aster	S5
Oryzopsis asperifolia	White-grained Mountain Rice	S5
Picea glauca	White Spruce	S5
Pinus strobus	Eastern White Pine	S5
Populus tremuloides	Trembling Aspen	S5
Prenanthes trifoliolata	Three-leaved Rattlesnakeroot	S5
Pteridium aquilinum	Bracken Fern	S5
Rubus allegheniensis	Alleghaney Blackberry	S5
Rubus idaeus	Red Raspberry	S5
Salix spp.	Willow Species	N/A
Senecio jacobaea	Tansy Ragwort	SNA
Solidago rugosa	Rough-stemmed Goldenrod	S5
Streptopus lanceolatus	Rose Twisted-stalk	S5
Trientalis borealis	Northern Starflower	S5
Vaccinium angustifolium	Late Lowbush Blueberry	S5
Vaccinium myrtilloides	Velvet-leaved Blueberry	S5

Turbine #12		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Acer rubrum	Red Maple	S5
Anaphalis margaritacea	Pearly Everlasting	S5
Aralia hispida	Bristly Sarsaparilla	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Betula populifolia	Gray Birch	S5
Carex projecta	Necklace Sedge	S5
Chamerion angustifolium	Fireweed	S5
Cornus canadensis	Bunchberry	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Epilobium ciliatum	Northern Willowherb	S5
Fragaria virginiana	Wild Strawberry	S5
Hieracium caespitosum	Field Hawkweed	SNA
Lycopodium annotinum	Stiff Clubmoss	S5
Lycopodium clavatum	Running Clubmoss	S5
Maianthemum canadense	Wild Lily-of-The-Valley	S5
Picea glauca	White Spruce	S5
Picea rubens	Red Spruce	S5
Pinus strobus	Eastern White Pine	S5
Polygonum cilinode	Fringed Black Bindweed	S5
Rubus allegheniensis	Alleghaney Blackberry	S5
Rubus idaeus	Red Raspberry	S5
Senecio jacobaea	Tansy Ragwort	SNA
Solidago rugosa	Rough-stemmed Goldenrod	S5
Trientalis borealis	Northern Starflower	S5
Vaccinium angustifolium	Late Lowbush Blueberry	S5
Vaccinium myrtilloides	Velvet-leaved Blueberry	S5
Veronica officinalis	Common Speedwell	S5

TxCorr Part 2		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Acer rubrum	Red Maple	S5
Anaphalis margaritacea	Pearly Everlasting	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Betula populifolia	Gray Birch	S5
Cornus canadensis	Bunchberry	S5
Cypripedium acaule	Pink Lady's-Slipper	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Dryopteris carthusiana	Spinulose Wood Fern	S5
Dryopteris intermedia	Evergreen Wood Fern	S5
Euthamia graminifolia	Grass-leaved Goldenrod	S5
Fragaria vesca	Woodland Strawberry	S4
Fragaria virginiana	Wild Strawberry	S5
Hieracium pilosella	Mouse-ear Hawkweed	SNA
Kalmia angustifolia	Sheep Laurel	S5
Maianthemum canadense	Wild Lily-of-The-Valley	S5
Melampyrum lineare	American Cow Wheat	S5
Oclemena acuminata	Whorled Wood Aster	S5
Oryzopsis asperifolia	White-grained Mountain Rice	S5
Picea glauca	White Spruce	S5
Pinus strobus	Eastern White Pine	S5
Populus tremuloides	Trembling Aspen	S5
Prenanthes trifoliolata	Three-leaved Rattlesnakeroot	S5
Pteridium aquilinum	Bracken Fern	S5
Rubus allegheniensis	Alleghaney Blackberry	S5
Rubus idaeus	Red Raspberry	S5
Salix spp.	Willow Species	N/A
Senecio jacobaea	Tansy Ragwort	SNA
Solidago rugosa	Rough-stemmed Goldenrod	S5
Streptopus lanceolatus	Rose Twisted-stalk	S5
Trientalis borealis	Northern Starflower	S5
Vaccinium angustifolium	Late Lowbush Blueberry	S5
Vaccinium myrtilloides	Velvet-leaved Blueberry	S5

TxCorr Part 1 continued		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Alnus incana	Speckled Alder	S5
Arenaria serpyllifolia	Thyme-leaved Sandwort	SNA
Arisaema triphyllum	Jack-in-the-pulpit	S5
Carex echinata	Star Sedge	S5
Carex lurida	Sallow Sedge	S5
Carex projecta	Necklace Sedge	S5
Carex scoparia	Broom Sedge	S5
Chimaphila umbellata	Common Pipsissewa	S5
Cornus sericea	Red Osier Dogwood	S5
Corylus cornuta	Beaked Hazel	S5
Crataegus spp.	Hawthorn Species	N/A
Dryopteris carthusiana	Spinulose Wood Fern	S5
Dryopteris intermedia	Evergreen Wood Fern	S5
Echinocystis lobata	Wild Cucumber	S5
Eupatorium maculatum	Spotted Joe-pye-weed	S5
Eupatorium perfoliatum	Common Boneset	S5
Fragaria virginiana	Wild Strawberry	S5
Galium asprellum	Rough Bedstraw	S5
Galium palustre	Common Marsh Bedstraw	S5
Galium verum	Yellow Bedstraw	SNA
Geranium robertianum	Herb Robert	S2S3
Geum aleppicum	Yellow Avens	S5
Geum canadense	White Avens	S5
Glyceria grandis	Common Tall Manna Grass	S5
Glyceria laxa	Northern Mannagrass	S4?
Glyceria melicaria	Slender Manna Grass	S5
Hieracium aurantiacum	Orange Hawkweed	SNA
Hieracium caespitosum	Field Hawkweed	SNA
Hieracium pilosella	Mouse-ear Hawkweed	SNA
Juncus effusus	Soft Rush	S5
Lysimachia terrestris	Swamp Yellow Loosestrife	S5
Malus pumila	Common Apple	SNA
Medeola virginiana	Indian Cucumber Root	S5
Mentha arvensis	Wild Mint	S5
Myosotis laxa	Small Forget-Me-Not	S5
Oenothera perennis	Perennial Evening Primrose	S5
Onoclea sensibilis	Sensitive Fern	S5
Oxalis montana	Common Wood Sorrel	S5
Oxalis stricta	European Wood Sorrel	S5
Pastinaca sativa	Wild Parsnip	SNA
Picea glauca	White Spruce	S5
Pinus banksiana	Jack Pine	S5
Polygonum cilinode	Fringed Black Bindweed	S5
Polygonum hydropiperoides	False Waterpepper	S4

Potentilla norvegica	Rough Cinquefoil	S5
Prunus pensylvanica	Pin Cherry	S5
Prunus virginiana	Chokecherry	S5
Ranunculus acris	Common Buttercup	SNA
Ribes spp.	Currant Species	N/A
Rubus allegheniensis	Alleghaney Blackberry	S5
Rubus hispidus	Bristly Dewberry	S5
Sambucus racemosa	Red Elderberry	S5
Scirpus cyperinus	Common Woolly Bulrush	S5
Scirpus microcarpus	Small-fruited Bulrush	S5
Scutellaria galericulata	Marsh Skullcap	S5
Scutellaria lateriflora	Mad-dog Skullcap	S5
Solanum dulcamara	Bittersweet Nightshade	SNA
Solidago rugosa	Rough-stemmed Goldenrod	S5
Thalictrum pubescens	Tall Meadow-Rue	S5
Viola cucullata	Marsh Blue Violet	S5

Total Vegetation Species		
Vegetation Species		
Scientific Name	Common Name	S-Rank
Abies balsamea	Balsam Fir	S5
Acer pensylvanicum	Striped Maple	S5
Acer rubrum	Red Maple	S5
Acer saccharum	Sugar Maple	S5
Acer spicatum	Mountain Maple	S5
Actaea pachypoda	White Baneberry	S4
Actaea rubra	Red Baneberry	S5
Alisma triviale	Northern Water Plantain	S5
Amelanchier spp.	Serviceberry Species	N/A
Aralia hispida	Bristly Sarsaparilla	S5
Aralia nudicaulis	Wild Sarsaparilla	S5
Arenaria serpyllifolia	Thyme-leaved Sandwort	SNA
Arisaema triphyllum	Jack-in-the-pulpit	S5
Athyrium filix-femina	Common Lady Fern	S5
Betula alleghaniensis	Yellow Birch	S5
Betula papyrifera	Paper Birch	S5
Betula populifolia	Gray Birch	S5
Calamagrostis canadensis	Bluejoint Reed Grass	S5
Carex communis	Fibrous-Root Sedge	S5
Carex cumulata	Dense Sedge	S4S5
Carex disperma	Two-seeded Sedge	S5
Carex echinata	Star Sedge	S5
Carex intumescens	Bladder Sedge	S5
Carex lurida	Sallow Sedge	S5
Chimaphila umbellata	Common Pipsissewa	S5
Chrysosplenium americanum	American Golden Saxifrage	S5
Circaea alpina	Small Enchanter's Nightshade	S5
Clintonia borealis	Yellow Bluebead Lily	S5
Comptonia peregrina	Sweet-fern	S5
Coptis trifolia	Goldthread	S5
Cornus alternifolia	Alternate-leaved Dogwood	S5
Cornus canadensis	Bunchberry	S5
Cornus sericea	Red Osier Dogwood	S5
Corylus cornuta	Beaked Hazel	S5
Crataegus spp.	Hawthorn Species	N/A
Cypripedium acaule	Pink Lady's-Slipper	S5
Dennstaedtia punctilobula	Eastern Hay-Scented Fern	S5
Diervilla lonicera	Northern Bush Honeysuckle	S5
Digitalis Spp.	Foxglove Species	N/A
Doellingeria umbellata	Hairy Flat-top White Aster	S5
Dryopteris carthusiana	Spinulose Wood Fern	S5
Dryopteris cristata	Crested Wood Fern	S5
Euthamia graminifolia	Grass-leaved Goldenrod	S5
Fragaria vesca	Woodland Strawberry	S4

Fragaria virginiana	Wild Strawberry	S5
Galium mollugo	Smooth Bedstraw	SNA
Galium palustre	Common Marsh Bedstraw	S5
Galium verum	Yellow Bedstraw	SNA
Gaultheria hispidula	Creeping Snowberry	S5
Gaultheria procumbens	Eastern Teaberry	S5
Geranium robertianum	Herb Robert	S2S3
Geum aleppicum	Yellow Avens	S5
Geum canadense	White Avens	S5
Geum macrophyllum	Large-Leaved Avens	S5
Glyceria grandis	Common Tall Manna Grass	S5
Glyceria laxa	Northern Mannagrass	S4?
Glyceria melicaria	Slender Manna Grass	S5
Gymnocarpium dryopteris	Common Oak Fern	S5
Hamamelis virginiana	American Witch-Hazel	S4
Hieracium aurantiacum	Orange Hawkweed	SNA
Hieracium caespitosum	Field Hawkweed	SNA
Hieracium pilosella	Mouse-ear Hawkweed	SNA
Impatiens capensis	Spotted Jewelweed	S5
Juncus effusus	Soft Rush	S5
Kalmia angustifolia	Sheep Laurel	S5
Lactuca biennis	Tall Blue Lettuce	S5
Linnaea borealis	Twinflower	S5
Lonicera canadensis	Canada Fly Honeysuckle	S5
luzula acuminata	Hairy Woodrush	S5
Lycopodium annotinum	Stiff Clubmoss	S5
Lycopodium clavatum	Running Clubmoss	S5
Lysimachia terrestris	Swamp Yellow Loosestrife	S5
Maianthemum canadense	Wild Lily-of-The-Valley	S5
Malus pumila	Common Apple	SNA
Medeola virginiana	Indian Cucumber Root	S5
Melampyrum lineare	American Cow Wheat	S5
Mentha arvensis	Wild Mint	S5
Mimulus moschatus	Musk Monkeyflower	SNA
Moneses uniflora	One-flowered Wintergreen	S5
Monotropa uniflora	Indian Pipe	S5
Myosotis laxa	Small Forget-Me-Not	S5
Oclemena acuminata	Whorled Wood Aster	S5
Oenothera perennis	Perennial Evening Primrose	S5
Onoclea sensibilis	Sensitive Fern	S5
Orthilia secunda	One-sided Wintergreen	S5
Oryzopsis asperifolia	White-grained Mountain Rice	S5
Osmunda claytoniana	Interrupted Fern	S5
Oxalis montana	Common Wood Sorrel	S5
Oxalis stricta	European Wood Sorrel	S5
Packera aurea	Golden Groundsel	S4S5
Pastinaca sativa	Wild Parsnip	SNA
Phegopteris connectilis	Northern Beech Fern	S5
Picea glauca	White Spruce	S5

Picea rubens	Red Spruce	S5
Pinus banksiana	Jack Pine	S5
Pinus strobus	Eastern White Pine	S5
Polygonum cilinode	Fringed Black Bindweed	S5
Polygonum hydropiperoides	False Waterpepper	S4
Populus grandidentata	Large-toothed Aspen	S5
Populus tremuloides	Trembling Aspen	S5
Potentilla norvegica	Rough Cinquefoil	S5
Prenanthes trifoliolata	Three-leaved Rattlesnakeroot	S5
Prunella vulgaris	Common Self-heal	S5
Prunus pensylvanica	Pin Cherry	S5
Prunus Spp.	Plum Species	N/A
Prunus virginiana	Chokecherry	S5
Pteridium aquilinum	Bracken Fern	S5
Pyrola chlorantha	Green-flowered Pyrola	S4
Pyrola elliptica	Shinleaf	S5
Ranunculus acris	Common Buttercup	SNA
Rhus typhina	Staghorn Sumac	S5
Ribes spp.	Currant Species	N/A
Rosa spp.	Rose Species	N/A
Rubus allegheniensis	Alleghaney Blackberry	S5
Rubus hispidus	Bristly Dewberry	S5
Rubus idaeus	Red Raspberry	S5
Salix spp.	Willow Species	N/A
Sambucus nigra ssp. canadensis	Black Elderberry	S5
Sambucus racemosa	Red Elderberry	S5
Scirpus cyperinus	Common Woolly Bulrush	S5
Scirpus microcarpus	Small-fruited Bulrush	S5
Scutellaria galericulata	Marsh Skullcap	S5
Scutellaria lateriflora	Mad-dog Skullcap	S5
Senecio jacobaea	Tansy Ragwort	SNA
Sisyrinchium montanum	Mountain Blue-eyed-grass	S5
Solanum dulcamara	Bittersweet Nightshade	SNA
Solidago canadensis	Canada Goldenrod	S5
Solidago rugosa	Rough-stemmed Goldenrod	S5
Solidago Spp.	Goldenrod Species	N/A
Sorbus americana	American Mountain Ash	S5
Spiraea alba	White Meadowsweet	S5
Streptopus lanceolatus	Rose Twisted-stalk	S5
Taraxacum officinale	Common Dandelion	SNA
Thalictrum pubescens	Tall Meadow-Rue	S5
Thelypteris noveboracensis	New York Fern	S5
Thuja occidentalis	Eastern White Cedar	S5
Trientalis borealis	Northern Starflower	S5
Trillium erectum	Red Trillium	S5
Trillium undulatum	Painted Trillium	S5
Tsuga canadensis	Eastern Hemlock	S5
Urtica dioica	Stinging Nettle	S4

Vaccinium myrtilloides	Velvet-leaved Blueberry	S5
Veronica officinalis	Common Speedwell	S5
Veronica serpyllifolia	Thyme-Leaved Speedwell	SNA
Viburnum lantanoides	Hobblebush	S5
Viburnum nudum	Northern Wild Raisin	S5
Viola cucullata	Marsh Blue Violet	S5
Viola Spp.	Violet Species	N/A

Appendix B

Additional Site Photographs

Photo 1: View of clear cut areas along proposed transmission line facing south east from south side of the Kennebecasis River.

Photo 2: Herb-Robert (*Geranium robertianum*) (S2S3) identified within the assessment area

Photo 3: Mature hemlock dominant stand located adjacent to the proposed transmission line corridor on the northwest side.

Photo 4: Clear cut stand with large red pine and white pine retention located near the south end of the proposed transmission line corridor.

Photo 5: Representative photo of young pre-commercially thinned hardwood stand along the proposed transmission line corridor.

Photo 6: Representative photo of young pre-commercially thinned hardwood stands along the proposed transmission line corridor.

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