August 2011

NORTHLAND POWER

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McLean's Mountain Wind Farm

Environmental Impact Study Report

Submitted by:

DILLON CONSULTING

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1. Introduction

Northland Power Inc. (Northland Power) and Mnidoo Mnising Power (MMP), propose to develop a wind facility with a maximum name plate capacity of 60 megawatts (MW) located south of Little Current in the Town of Northeastern Manitoulin and the Islands, Ontario (**Figure 1**). The renewable energy facility will be known as the McLean's Mountain Wind Farm and will be rated as a Class 4 wind facility. Northland Power has received a contract from the Ontario Power Authority (OPA) for the purchase of electricity generated by wind turbines from this renewable facility through the Province's Feed-in-Tariff (FIT) program (enabled by the Green Energy and Green Economy Act). The project will require approval under *Ontario Regulation 359/09 – Renewable Energy Approval* (REA or Ontario Regulation 359/09) under Section V.0.1 of the *Ontario Environmental Protection Act*.

Ontario Regulation 359/09 requires that all renewable energy projects prepare an Environmental Impact Study (EIS) Report to address any natural features that have been evaluated to be significant or provincially significant in the Evaluation of Significance Report (REA Section 38) and occur within 120m of the project location. This EIS Report is the fourth and final report in a series that fulfills the requirements of the natural heritage assessment as required by Ontario Regulation 359/09. The EIS Report will detail the potential impacts, mitigation and monitoring requirements to protect natural features within and adjacent to the project location. Discussion Species at Risk and other information needs, as outlined in the MNR's Approval and Permitting Requirements Document for Renewable Energy (MNR 2009), are discussed in a separate report, under direction from the MNR and in compliance with the REA.

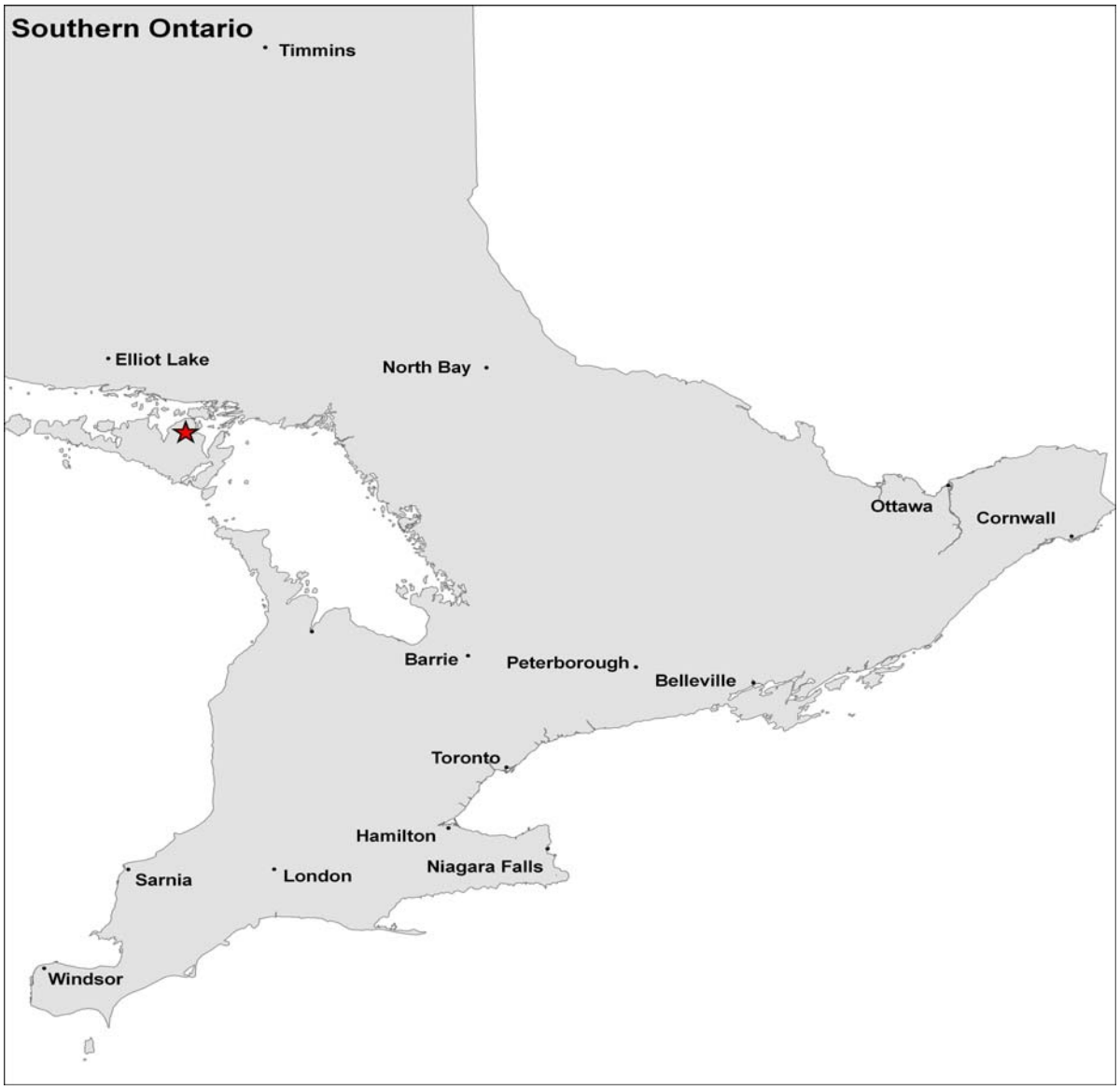

Figure 1: General Location of the McLean's Mountain Wind Farm Project in Ontario

2. The Proponent

Northland Power, founded in 1987, is an experienced developer, owner and operator of renewable power generation in Canada and abroad. Company activities include developing, managing, financing and owning renewable energy facilities. In the course of developing renewable energy projects, Northland Power satisfies various environmental approval requirements and obtains regulatory approvals that vary depending on the jurisdiction, project capacity and site location. In addition, Northland Power builds long-term relationships with the communities that host its' projects. Northland Power is committed to the health and welfare of the community of Little Current and the Town of Northeastern Manitoulin and the Islands.

Contact information for the Proponent is as follows:

Full Name of Company:	*Northland Power Incorporated*
Address:	*30 St. Clair Avenue West, 17th Floor*
Telephone:	*(705) 271-5358, (705) 368-0303*
Prime Contact:	*Rick Martin - Project Manager*
Email:	*rickmartin@northlandpower.ca*

Dillon Consulting Limited is the prime contractor for the preparation of this EIS Report. The contact at Dillon is:

Full Name of Company:	*Dillon Consulting Limited*
Address:	*235 Yorkland Blvd, Suite 800* *Toronto, Ontario, M2J 4Y8*
Telephone:	*(416) 229-4646 ext 2355*
Fax:	*(416) 229-4692*
Prime Contact:	*Don McKinnon, REA Project Manager*
Email:	*DPMckinnon@dillon.ca*

3. Project Location

The proposed Class 4 wind facility is located in the Municipality of Northeastern Manitoulin and the Islands in northeastern Ontario, covering approximately 8,200 ha of land south of the Town of Little Current. **Figure 1** shows the general location of the project. **Figure 2** shows the project location as defined in Ontario Regulation 359/09, which is the location encompassing all projects components and includes the 120 m setbacks. Project components, including wind turbines, construction areas and electrical facilities such as transmission line, inverters, transformers, substations and electrical feeder lines, will be located on private land or municipal rights-of-way. Section 4 of this report summarize the results of the natural heritage assessment and identifies significant and/or provincially significant natural features in the project location and adjacent lands, in accordance with the requirements of Section 27 of Ontario Regulation 359/09 and thus require an EIS under Section 38. The planned wind facility will occur primarily within lands currently zoned as rural, with small areas zoned as agricultural and hazard lands (Municipality of Northeastern Manitoulin and the Islands 2002).

Turbines 31, 34, 39, 40, 43 are being permitted as alternate sites (listed as Five Extra Permitted Sites in the legend of report mapping). While construction of turbines at these sites is not anticipated, it is desirable to have approved alternate sites in the event that any of the other turbines sites proves not to be constructible. It is recognized that no access road is provided for alternate turbine sites in the southwest corner of the project location (Turbine 31, 39, 40 and 43). If turbine construction at one or more of these alternate sites in the southwest portion of the project location is determined necessary, NPI will obtain any additional approvals as required for the access road, prior to construction.

NORTHLAND POWER

McLean's Mountain Wind Farm
Figure 2: Project Location

Legend

- Local Roads
- Highway
- 120 m Project Component Setback
- Lots/Concessions
- Water Body
- Watercourse
- Woodland
- Unevaluated Wetland

Project Components

- 24 Wind Turbine Locations
- Five Extra Permitted Sites
- Substation
- Operations Building
- Horizontal Directional Drilling Access/Exit Pit
- Access Road
- Feeder Lines
- Transmission Line
- Construction Staging Area

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4. Project Summary

An evaluation of significance was completed according to Section 27 of Ontario Regulation 359/09. This evaluation was preceded by a Records Review and a Site Investigation, as per Sections 25 and 26 of Ontario Regulation 359/09, respectively. A summary of relevant project natural features, detailed in previous reports, is outlined in **Table 1.**

Table 1: Summary of the Natural Heritage Assessment for McLean's Mountain Wind Farm

Natural Feature	Applicable Project Component(s)	Distance Between Feature & Project Location (metres)	Summary of Natural Heritage Assessment			EIS Required?
			Identified During Records Review?	Identified, Verified or Refined During Site Investigation?	Evaluation of Significance Results	
Provincial Parks and Conservation Reserves						
Not applicable to project location						
ANSI, Life Science						
Not applicable to project location						
ANSI, Earth Science						
Not applicable to project location						
Valleylands						
Not applicable to project location						
Wetlands						
1	T40, Horizontal Directional Drilling (HDD) Access/Exit Pit, Access Road, Feeder Lines	30 m	✓	Refined	Prov. Significant	✓
2	HDD Access/Exit Pit, Feeder Lines	30 m	☒	Identified	Prov. Significant	✓
3	HDD Access/Exit Pit, Access Road, Feeder Lines	25 m	☒	Identified	Prov. Significant	✓
4	Access Road, Feeder Lines	0m	☒	Identified	Prov. Significant	✓
5	Access Road, Feeder Lines	0m	☒	Identified	Prov. Significant	✓
6	HDD Access/Exit Pit, Access Road, Feeder Lines, T23	30 m	☒	Identified	Prov. Significant	✓
7	Access Road, Feeder Lines, T30	52 m	✓	Refined	Prov. Significant	✓
8	Access Road	5 m	☒	Identified	Prov. Significant	✓

Natural Feature	Applicable Project Component(s)	Distance Between Feature & Project Location (metres)	Summary of Natural Heritage Assessment			EIS Required?
			Identified During Records Review?	Identified, Verified or Refined During Site Investigation?	Evaluation of Significance Results	
9	Access Road	2 m	☒	Identified	Prov. Significant	✓
10	Access Road	40 m	☒	Identified	Prov. Significant	✓
11	Access Road	75 m	☒	Identified	Not Significant	☒
12	Transmission line	Within	☒	Identified	Not Significant	☒
Seasonal Concentration Areas						
Waterfowl Nesting Area – WNA 1	HDD Access/Exit Pit, Feeder Line and Access Road, T40, T42	Within project location	☒	Identified as Candidate	Significant	✓
Waterfowl Nesting Area – WNA 4	HDD Access/Exit Pit, Feeder Line and Access Road, T29	Within project location	☒	Identified as Candidate	Significant	✓
Waterfowl Nesting Area – WNA 5	T6	Within 120m	☒	Identified as Candidate	Significant	✓
Waterfowl Nesting Area – WNA 2 & 3	HDD Access/Exit Pit, Feeder Line and Access Road,	Within project location	☒	Identified as Candidate	Not Significant	☒
Raptor Winter Feeding and Roosting Area RWFR 1 & 2	HDD Access/Exit Pit, Feeder Line, Access Road, T16, T29	Within project location	☒	Identified as Candidate	Not Significant	☒
Raptor Winter Feeding and Roosting Area RWFR 3	Turbine 34, Feeder Line and Access Road	Within project location	☒	Identified as Candidate	Significant	✓
Raptor Winter Feeding and Roosting Area RWFR 4	T6, T5, T13, T10, T9, T15, T19, T20 Construction Staging Area, Feeder line and Transmission line -	Within project location	☒	Identified as Candidate	Significant	✓
Bullfrog Concentration Area - BCA 1, 2, 3, 4, 5 & 6	HDD Access/Exit Pit, Feeder Line and Access Road, T40, T23	Within 120m	☒	Identified as Candidate	Not Significant	☒

Natural Feature	Applicable Project Component(s)	Distance Between Feature & Project Location (metres)	Summary of Natural Heritage Assessment			EIS Required?
			Identified During Records Review?	Identified, Verified or Refined During Site Investigation?	Evaluation of Significance Results	
Rare Vegetation Communities						
Alvar - ALV 1, 2	Feeder Line	Within 120m	☒	Identified as Candidate	Significant	✓
Alvar - ALV 3	Feeder Line & HDD Access/Exit Pit	Within project location	☒	Identified as Candidate	Significant	✓
Alvar - ALV 4	Transmission Line	Within 120m	☒	Identified as Candidate	Significant	✓
Alvar - ALV 5	Transmission Line	Within project location	☒	Identified as Candidate	Not Significant	☒
Specialised Wildlife Habitat						
Woodland Amphibian Breeding Habitat - WABH 1 & 7	Feeder Line & HDD Access/Exit Pit	Within 120 m	☒	Identified as Candidate	Significant	✓
Woodland Amphibian Breeding Habitat – WABH 2	T40, Feeder Line and Access Road	Within 120 m	☒	Identified as Candidate	Significant	✓
Woodland Amphibian Breeding Habitat - WABH 3 & 4	Feeder Line & HDD Access/Exit Pit	Within 120 m	☒	Identified as Candidate	Not Significant	☒
Woodland Amphibian Breeding Habitat - WABH 5	HDD Access/Exit Pit, Feeder Line & Access Road	Within 120 m	☒	Identified as Candidate	Significant	✓
Woodland Amphibian Breeding Habitat - WABH 6	Feeder Line & Access Road	Within 120 m	☒	Identified as Candidate	Significant	✓
Woodland Amphibian Breeding Habitat - WABH 8	Feeder Line & T23	Within 120 m	☒	Identified as Candidate	Significant	✓
Turtle Overwintering Areas - TOA 1	T40, HDD Access/Exit Pit, Feeder Line &	Within 120 m	☒	Identified as Candidate	Significant	✓

Natural Feature	Applicable Project Component(s)	Distance Between Feature & Project Location (metres)	Summary of Natural Heritage Assessment			EIS Required?
			Identified During Records Review?	Identified, Verified or Refined During Site Investigation?	Evaluation of Significance Results	
	Access Road					
Turtle Overwintering Areas - TOA 2	HDD Acess/Exit Pit, Feeder Line	Within 120 m	☒	Identified as Candidate	Significant	✓
Turtle Overwintering Areas - TOA 3	HDD Access/Exit Pit, Feeder Line & Access Road	Within 120 m	☒	Identified as Candidate	Significant	✓
Turtle Overwintering Areas - TOA 4	Feeder Line	Within 120 m	☒	Identified as Candidate	Significant	✓
Turtle Overwintering Areas - TOA 5	HDD Access/Exit Pit, T23, Feeder Line and Access Road	Within 120 m	☒	Identified as Candidate	Significant	✓
Turtle Overwintering Areas - TOA 6	Access Road	Within 120 m	☒	Identified as Candidate	Significant	✓
Sites Supporting Area-sensitive Species: Forest Birds - FB 1	T43, T39, Feeder line & Access Road	Within project location	☒	Identified as Candidate	Significant	✓
Sites Supporting Area-sensitive Species: Forest Birds - FB 2	HDD Access/Exit Pit & Feeder Line	Within project location	☒	Identified as Candidate	Significant	✓
Sites Supporting Area-sensitive Species: Forest Birds - FB 3, 4 & 5	HDD Access/Exit Pit, T17, T21, T11, T14, Feeder Line & Access Road	Within project location	☒	Identified as Candidate	Not Significant	☒
Sites Supporting Area-sensitive Species: Open Country Breeding Birds - OCBB 1	Feeder Line & Access Road	Within project location	☒	Identified as Candidate	Not Significant	☒
Sites Supporting Area-sensitive Species: Open Country Breeding Birds - OCBB 2	HDD Access/Exit Pit, T29, T16, Feeder Line & Access Road	Within project location	☒	Identified as Candidate	Not Significant	☒

Natural Feature	Applicable Project Component(s)	Distance Between Feature & Project Location (metres)	Summary of Natural Heritage Assessment			EIS Required?
			Identified During Records Review?	Identified, Verified or Refined During Site Investigation?	Evaluation of Significance Results	
Sites Supporting Area-sensitive Species: Open Country Breeding Birds - OCBB 3	T34	Within 120m	☒	Identified as Candidate	Significant	✓
Sites Supporting Area-sensitive Species: Open Country Breeding Birds - OCBB 4	T6, T5, T13, T10, T9, T15, Feeder Line, Construction Staging Area, Access Road & Transmission line	Within project location	☒	Identified as Candidate	Significant	✓
Sites Supporting Area-sensitive Species: Open Country Breeding Birds - OCBB 5	Access Road	Within project location	☒	Identified as Candidate	Not Significant	☒
Habitat of Species of Conservation Concern						
Northern Shrike	---	---	✓	Identified as Candidate	Not Significant	☒
Rough-legged Hawk	---	---	✓	Identified as Candidate	Not Significant	☒
Olive-sided Flycatcher	---	---	✓	Identified as Candidate	Not Significant	☒
Red-headed Woodpecker	---	---	✓	Identified as Candidate	Not Significant	☒
Short-eared Owl	See OCBB4	See OCBB4	✓	Identified as Candidate	Significant	✓
Bald Eagle	---	---	✓	Identified as Candidate	Not Significant	☒
Common Snapping Turtle	See TOA	See TOA	✓	Identified as Candidate	Significant	✓
Cooper's Milkvetch	T30	10 m from T30	✓	Identified as Candidate	Significant	✓
Slender Blazing Star	Transmission Line	Within 120m	✓	Identified as Candidate	Significant	✓
Clustered Broomrape	No occurrence known	--	✓	Identified as Candidate	Significant	✓
Prairie Dropseed	No occurrence known	--	✓	Identified as Candidate	Significant	✓

5. Environmental Impact Study Purpose

By completing an EIS Report in accordance with procedures established by the MNR, project components may be constructed and installed in and within 120 m of a significant or provincially significant natural feature, as identified in Section 38 of the REA, provided certain conditions are met. This report is consistent with Section 38 of Ontario Regulation 359/09, which details that an EIS Report must include the following:

- Identification and assessment of any negative environmental effects of the project on a natural feature, provincial park or conservation reserve;
- Identification of mitigation measures in respect of any negative environmental effects;
- Description of how the environmental effects monitoring plan in the Design and Operations Report addresses any negative environmental effects; and,
- Description of how the construction plan report addresses any negative environmental effects.

The focus of this EIS Report will be to fulfill the requirements of Section 38 for the significant/provincially significant natural features, provincial parks or conservation reserves identified in **Table 1** as being in or within 120 m of the project location.

6. Rationale for Development Within a Natural Feature or Setback

The development of this wind farm has been ongoing since 2004 and numerous field visits have been conducted during this time to identify constraints to development. Based on natural environment information collected, the project location has been revised and several turbines removed to avoid natural features, reducing the name plate capacity of the project. Optimization of the project location, in a manner that meets the requirements of *Ontario Regulation 359/09*, was completed as recently as July 2011. No portion of the project location is within a provincially significant southern wetland. The routing of project components around wetlands (i.e. access roads and feeder lines) uses existing roads, municipal road right-of-ways and horizontal directional drilling. To the extent possible, other natural features have been avoided and setbacks from project components have been maximized.

7. Description of Project Activities

Subject to the receipt of the necessary permits and approvals, site work for the McLean's Mountain Wind Farm is expected to begin as early as November 2011 and last for approximately 12-15 months. No special housing, healthcare or food facilities will be required during the construction period. Complete details of the project activities, construction, design, operations and decommissioning of this project can be found in the respective REA reports (i.e. Construction Report, Design and Operations Report, Decommissioning Report). Below, we provide a summary of key construction schedule dates and details of the construction operation and decommissioning phases of the project relative to the evaluation of impacts.

The anticipated construction schedule for the Proposed McLean's Mountain Wind Farm project is as follows:

- Site Preparation and Clearing: Fall 2011 for 4 weeks;
- Access Road Construction: May – June 2012;
- Foundation Construction: June – August 2012;
- Collector Line Installation May – June 2012
- Transmission Line Construction: June – August 2012;
- Installation of Transformer Substation July 2012
- Turbine Transportation & Lay Down June 2012
- Crane Erection June 2012
- Tower, Generator & Rotor Assembly July – August 2012
- Operations Building August - September 2012
- Electrical Interconnection: May 2012; and
- Commissioning: September 2012;

7.1 Construction Phase

A summary of the construction phase project activities is provided in **Table 2**.

Table 2: Summary of the Construction Phase Project Activities

Construction: Physical Works/Activities	Description of Activity	Equipment Required	Materials Required
Surveying & Geotechnical Investigations	The land survey activities included staking the boundaries of the construction areas, temporary workspace, access roads, distribution line routes, transmission line route, as well as marking the location of existing underground pipelines and cables. Geotechnical work involved taking bore samples in all proposed turbine locations. Required materials and equipment were transported to and removed from the site in light trucks. No materials were stored on site. Surveying and geotechnical investigations were conducted in from March 29 to May 10, 2011.	• 2- 10 tonne truck mounted drill rigs • Light trucks for transportation	• Exclusion fencing • Survey stakes
Site Preparation and Clearing	To create a safe and level work area for storing and assembling the wind turbine generators and towers, a suitable sized area may have to be stripped and leveled, depending on the local conditions. Bush, trees, and other vegetation will be cleared from the construction areas as required. An area of 0.3 hectares will be required for each turbine location for assembly of the turbine. There will also be some minor disturbance to the vegetation outside of the 0.3 hectares lay-down area as the wind turbine blades extend beyond this area. The clearing of a right-of-way will be required for some sections of the turbine access roads (15 metres) and sections of the 115 kV transmission line (8-10 metres) (details below). Graders, bulldozers, and backhoes will be used to strip any soil that could be present at the turbine foundation locations. All soil will be stored on-site for use in remediation. Following soil stripping, grading will be conducted on irregular ground surfaces, if any, to provide a safe and clean work surface. Grading will be done in such a manner so as to not alter drainage patterns in the area.	• 15-20 deliveries with flatbed trucks • 5-6 light trucks • 2 tracked bulldozers • 5 dump trucks • 2 compactors • 2 graders • 2 water trucks • Excavator	• 200-400 mm of pit run gravel • 50 mm of ¾ inch gravel • Geotextile material • Fuel and lubricating grease for construction equipment

Construction: Physical Works/Activities	Description of Activity	Equipment Required	Materials Required
	All materials will be transported to site in the dump trucks, flatbed and light trucks. The geotextiles will be stored at the construction lay-down area until required for access road and turbine foundation construction. All debris will be collected and disposed of at approved facilities. There is potential for noise and dust emissions and mitigation measures are discussed in the following section.		
Local Roads Improvements	Green Bush Road will have to be improved in at least two locations. Additional stone base may be added for strengthening as required. The width may be increased to 5.5 metres in some places and up to 8 metres in other places. Improvements may be required to 2 existing crossings along Greenbush Road of the Tributary of Manitowaning Bay) The intersection at Hwy 6 would be temporarily widened and the road grade and vertical curves would be adjusted. Townline Road may have to be widened in at least 1 location to accommodate the turbine deliveries. There is the potential that the intersection of Green Bush Road and McLean's Mountain Road will require widening of the turning radius. A 38.1 metre turning radius is required for the delivery of the wind turbine components. Widening of the turning radius would involve the placement of granular material to create a widened roadbed. The widened intersections would be removed after component delivery but the entrances and any culverts would remain.	• Similar equipment will be used as Site Preparation and Clearing activity.	• 200-400 mm of pit run gravel • 50 mm of ¾ inch gravel • Geotextile material • Fuel and lubricating grease for construction equipment
Access Road Construction	Turbine access roads will be installed to accommodate construction and maintenance vehicles and heavy equipment for larger repairs/replacements. Access roads will be 5 metres wide during both the construction and operations phases. For areas of crane walks, there will also be the need for a 6 metre compacted shoulder of native material (to be de-compacted later). The excavation of earth and some blasting of rock are expected to be required for the construction of the turbine access roads.	• Similar equipment will be used as Site Preparation and Clearing activity.	• 200-400 mm of pit run gravel • 50 mm of ¾ inch gravel • Geotextile material • Fuel and lubricating grease for construction equipment

Construction: Physical Works/Activities	Description of Activity	Equipment Required	Materials Required
	One new water crossings will be installed in order to develop the access roads (Tributary of Bass Lake). Access road culvert, of various diameters (See Waterbodies Assessment Report), will be constructed across the watercourses at the project location in order to accommodate vehicular access and construction traffic while maintaining unimpeded flow within the watercourse. The type of crossings and the mitigation measures will be developed in consultation with the appropriate governing bodies (Department of Fisheries and Oceans (DFO), Ontario Ministry of Natural Resources (OMNR)). All materials brought to site will be stored at the construction lay-down area until required for construction. Construction debris will be collected and disposed of at approved facilities. There is potential for noise and dust emissions and mitigation measures are discussed in the following section.		• Culverts of various sizes
Foundation Construction	Depending on soil conditions, the size of the excavation for the turbine tower will be 2.5 metres to 3 metres deep and 20 metres wide. Excavation will proceed until bedrock is exposed; in some cases this might be shallower than 12 inches. Any top soil would be stockpiled on site for future use. It is expected that either a spread base foundation or rock anchor foundation will be used. Depending on rock strength, blasting may be required for excavation in the bedrock. Blasting would be undertaken as per MNR and local municipal requirements. Suitable excavation material will be utilized in the foundation backfill and unsuitable excavated materials will be disposed of off-site at a licensed facility. For a gravity caisson or socket foundation, concrete will be poured into the forms continuously. The concrete will be sourced from a local supplier. The amount of concrete required will depend on ground/soil characteristics. The forms for the foundations will be removed and the excavated area back-filled compressed such that only the tower base portion of the foundation will be above ground.	• Tracked excavator • Tracked bulldozer • Concrete Pump Truck • Rough terrain mobile crane • Approximately 45 deliveries using 8-9 m^3 concrete trucks • Truck-mounted crane or rough terrain forklift	• The same equipment and materials land clearing activities • Approximately 365 m^3 of concrete • Approximately 32 metric tonnes of rebar plus formwork, anchor bolts, and embed rings

Construction: Physical Works/Activities	Description of Activity	Equipment Required	Materials Required
	There is potential for noise and dust emissions and mitigation measures are discussed in the following section.		
Collector Line Installation	Each turbine will be connected to the on-site transformer substation through a collector line system. The lines will primarily run along the turbine access roads and then along municipal roads RoW. The feeder lines will be buried unless it is determined to run the lines above ground to minimize effects to environmentally sensitive areas. Where overhead lines are required these will be supported by single poles. The above ground lines will require the installation of wood, steel or concrete monopoles to a depth of 2-5 metres The underground lines will be installed using a combination of trenching and ploughing to a depth of 1-1.5 metres and a width of 1 m. Two wetlands will be crossed with feeder lines using "Horizontal Directional Drilling" (HDD) to avoid impacts to the wetlands. HDD will be required under the wetland along the "Guida Sideroad (approximate 600 metre length), the Perch Creek crossing and for the crossing of the wetland located north of Perch Lake (approximate 800 metre length). The path of for the drilling of the wetland above Perch Lake will approximately follow the current trail/unopened road allowance. A directional boring machine (Vermeer machine) is to be used. HDD requires the use of a drilling fluid or "mud" consisting of silica and bentonite. HDD requires the excavation of pits at the desired inverts of the conduit at each end; the machine may or may not be in the pit. The bore will be approximately 20 cm in size. Once bored, a HDPE casing is then advanced, then the three conductors (one per phase), fiber optic duct, and separate ground cable (if used), are pulled through the casing. Where the underground line will cross a watercourse, the appropriate Department of Fisheries and Oceans (DFO) Operational Statements will be followed or a letter of authorization will be obtained. Construction debris will be collected and disposed of at approved facilities.	• The same equipment as land clearing activities will be used • 1 - 2Trenching machines • 1 Boom trucks • 1 - 2 Cable reels trailers	• Up to 35 km of 34.5 kV utility cable

Construction: Physical Works/Activities	Description of Activity	Equipment Required	Materials Required
Transmission Line Installation	A 115 kV line will be constructed to transmit the power to the Hydro One Transmission line on Goat Island. A switching station will be installed at the point of connection to the provincial grid. Connection to the grid will require submarine crossing of the North Channel (see below). The 115 kV transmission line will require a right-of-way of 8-10 metres. Some sections of the right-of-way will require clearing. It is expected that the tower structures of the transmission line would be composed of single poles and be spaced about 125 metres apart and installed to a typical depth of approximately 2.5 metres. The line has been routed to minimize its length and avoid sensitive environmental features. The transmission line will be above ground. Some minor variations to the alignment are possible dependant on public input and engineering considerations. Construction debris associated with the transmission will be collected and disposed of at approved facilities.	• The same equipment as land clearing activities will be used • 2 - 4 Auger trucks • 2 - 4 Boom/Bucket trucks • Approximately 2 Cable reels trucks and trailers	• Wood poles • Circuits (electrical wires) • Switching station • Submarine cable • Terminal structure at South side of Channel crossing
North Chanel Submarine Cable Crossing	It is proposed that the electrical transmission cables (115 kV) will cross the Little Current Channel at the eastern end of Manitoulin Island in a north-south orientation. A total of three (3) electrical cables are to be installed across the channel, in addition to one fiber optic cable. The marine cables crossing portion of the project extends between the north and south shores of the channel. At each shore, the marine cables will terminate at a concrete manhole installed on the respective banks back from the shoreline. On the south shore, the manhole is set back approximately 18 metres from water's edge. On the north shore where the ground slopes more gradually, the manhole is positioned approximately 40 metres beyond water's edge. Accordingly, the total length of the channel crossing of the marine cables between manholes on the north and south shores measures 490 metres. The armored cables are to be laid on the bottom of the channel. The cable	• The same equipment as land clearing activities will be used • 1 – 2 trenching machines • 1 Boom trucks • 1 - 2 Cable reels trailers • Barge to install the marine cable	• Armored 115 kV marine cable • Fiber optic cable

Construction: Physical Works/Activities	Description of Activity	Equipment Required	Materials Required
	will be placed underground at both shoreline locations. Conventional open cut trenching methods will be used for the near-shore and bank sections of the proposed channel crossing, the marine transmission cables will be buried in an excavated marine trench to provide the necessary protection and security with a minimum cover of 865 mm (34") over the top of the cables after backfilling. Some rock blasting could be required. Details regarding the cable design and method of construction is provided in Appendix C to this Construction Plan Report. Note that instead of trenching it is possible that the constructor may choose to directional drill the cable for the channel crossing. Once on Goat Island, the cable would remain underground to the point of interconnect with the provincial grid. The cable would be installed through conventional trenching construction methods. The property which the alignment passes through is owned by Canadian Pacific Railway, for which NPI has obtained an easement to pass through this property.		
Installation of Transformer Substation	The transformer substation will be constructed on leased land, Lot 13, Concession 5, Township of Howland/Bidwell. The substation site will be graded and graveled. The substation will comply with the requirements of O.Reg 359/09 by meeting the 40 dB noise limit at the nearest receptor. It will be located at least 500 metres from the nearest noise receptor. Substation grounding will follow the Canadian Electrical Code (CEC) Construction debris will be collected and disposed of at approved facilities.	• Tracked bulldozers, crane and excavators for installation	• Circuit breakers • Step-up power transformer • Isolation switch • Distribution switch-gear • Instrument transformers • Grounding • Revenue metering • Substation control and communication building • Oil containment system
Turbine Transportation and	Each of the disassembled turbines and generators will be trucked to the site on a flat-deck trailer for assembly within a temporary construction area.	• 14 – 16 heavy haul trucks per WTG	• about 6–8 trailers to be located in laydown

Construction: Physical Works/Activities	Description of Activity	Equipment Required	Materials Required
Lay Down	Thirteen flat-bed trucks are required for each complete wind turbine unit. It will be necessary to undertake some local road intersection improvements to allow the trucks to make turns to access the project location. It may also be necessary to reinforce some of the bridges leading up to the site. The nature of these improvements will be confirmed in consultation with the municipality and all appropriate permitting and approvals will be obtained.	delivery including 9-10 specialized 34-60 meter transport trucks • Will be concurrent with and will use the same equipment and materials as land clearing activities	area including EPC Contractor, WTG Supplier, Specialty Subcontractor(s) and Owner
Crane Erection	A crane pad will be installed at each turbine site to accommodate cranes to erect the turbine. The crane pads will be constructed at-grade with a maximum slope of 1%. An area of approximately 200 m^2 will be leveled and stoned to a 300-600 mm depth to accommodate each crane pad. An area 50 metres of each crane pad will be used for assembly of the wind turbine rotor and storage of the turbine components. Construction debris will be collected and disposed of at approved facilities.	• Approximately 15 heavy duty trucks to transport crane equipment • Will use the same equipment and materials as land clearing activities	
Tower, Generator, and Rotor Assembly	The tower comes in four sections that are assembled at the turbine sites one section at a time. The nacelle, which houses the generator, is lifted by a crane and attached to the top of the top tower section. The rotor will be lifted by crane and attached to the nacelle. Construction debris will be collected and disposed of at approved facilities.	• 1-Crane (600-800 tonnes crane with two assist crane) • Crane (200-300Ton) Rough terrain mobile cranes • 2 rough terrain fork lifts	Turbine towers, delivered in 5 sections: • nacelles • blades • rotors and hubs • pad-mounted transformers
Operations Building Construction	An operations building will be constructed on-site next to the sub-station location. The operations building will be approximately 15 metres by 30 metres (450 m^2) in size. It will provide office and storage space and a workspace for maintenance of equipment. A well will be required to provide a potable source of water for the Operations and Maintenance building. Domestic waste water will be managed by the construction of a small septic system.	• deliveries with flatbed trucks • light trucks • tracked bulldozers • dump trucks • compactors • graders • Excavator	Typical building materials (wood, brick, metal, concrete, etc.)
Wind Farm	Turbine commissioning can occur once the wind turbines have been fully	• Same equipment as site	• Sand

Construction: Physical Works/Activities	Description of Activity	Equipment Required	Materials Required
Commissioning	installed and the electrical connections are completed. The commissioning involves testing and inspection of electrical, mechanical, and communications operability. A detailed set of operating instructions must be followed in order to connect with the local electrical system.	clearing activity • 4000 L Sewage tank • piping	• Stone • Weeping Tile
Site Rehabilitation	Garbage and debris will be removed and disposed of at an approved location. Slash trees will be chipped if requested by the landowner. All equipment and vehicles will be removed from the construction area. The proponent will prepare a Generator Waste Registration Report for each waste that will be generated on site as per O.Reg. 347 of the EPA. If spills occurred during the construction phase, spill affected areas will be remediated. Emergency oil spill kits will be maintained on site during the construction and operation of the project. All waste fluids and oils will be removed from the site and recycled, where possible, or disposed of according to provincial guidelines. The temporary lay-down areas and disturbed areas around the foundation of each turbine and at the substation will be replaced with the stockpiled topsoil. The disturbed areas (including trenches/plough seams) will be allowed to re-naturalize or be re-seeded and maintained at the discretion of the landowner.	• Graders • Dump Trucks • Loaders • Excavators • Tracked bulldozers • Light Trucks	• Fuel and grease for equipment

7.1.1 Environmental Construction Monitoring

An environmental construction monitoring program will be carried out during the construction phase of the McLean's Mountain Wind Farm project to ensure that the committed mitigation measures (see **Section 9** and **10** of this document) are carried out and are effective. The environmental monitoring program will be carried out by the project owner's "Environmental Monitor" who will be independent from the construction contractor. The Environmental Monitor will have the authority to halt construction if, in their opinion, the required mitigating measures are not being adhered to and which potentially could result in unacceptable environmental effects.

Daily written logs will be compiled to document the inspection work. Documentation will include any instructions given to the contractor regarding environmental effects and the corrective actions taken. Upon completion of the work, a site inspection and rehabilitation report will be prepared.

7.1.2 Emergency Response Plan

The Emergency Response Plan (ERP) is described in the Environmental Management and Protection Plan (EMPP) in the Design Operations Report. The ERP is to be used in the event of an emergency and includes contact information for regulators, landowners, and other stakeholders. All appropriate regulators will be notified should the emergency include any potential impact to the health and safety of local residents or the environment.

7.2 Operations Phase

7.2.1 Wind Turbine Operation

The wind turbines will be operated in a manner consistent with nationally recognized standards for operation of wind turbine facilities in Canada. The project will be operated by a staff of 10 people who would work out of the on-site operations building. Typical generated traffic would be low and include staff traveling to and from the operations building to visit/inspect the turbines, as required.

A communication system will be installed that will provide on-site notification and also allow remote monitoring of the status of the turbines. Components defined as critical, such as the

rotor, generator, gearbox and cooling system, will be monitored using a supplier designed system to ensure safe shutdown. Controls will be implemented for fail safe action in the event of electrical or instrument losses.

The wind turbine system will be integrated with the electric interconnection Supervisory Control and Data Acquisition (SCADA) to ensure that the project critical controls, alarms and functions are properly coordinated for safe, secure and reliable operation.

At least one (1), but possibly all, of the existing four (4) currently installed meteorological monitoring towers will continue to be operated throughout the operation of the wind farm to assist NPI and MMP in assessing the performance of the turbines.

7.2.2 Wind Turbine and Ancillary Facilities Maintenance

Normal maintenance on the individual wind turbines occurs twice per year. It involves complete checks of structural soundness, checks of the electronics systems, changing of hydraulic and lubricating fluids, etc. Two person teams, for safety reasons, conduct maintenance. The expected maintenance time involved is two days per turbine. Unexpected maintenance occurs infrequently and typically involves the replacement of a major component, such as a gearbox, transformer or blade. In the event of a major malfunction, a crane may be required to lift the affected component. Maintenance of the wind farm also includes other activities such as line maintenance and inspection and snow clearing.

7.3 Decommissioning Plan Overview

The wind turbine decommissioning process shall be initiated upon the termination of the leases with the landowners. The primary reason for the leases to be terminated would be the completion of the project's useful life or the lack of a power purchase agreement with the Ontario Power Authority (or legal successor) or another green energy power purchaser.

The decommissioning involves removing the wind turbine including, tower, generator, auxiliary equipment, above ground cables/poles, fixtures, all other personal property and otherwise restoring the premises to its original condition. If it is agreed upon with the landowner, access roads may be left in place for their continued use. Foundations shall be removed to original soil depth or three feet below grade, whichever is the lesser, and replaced with topsoil.

The project owners agree to meet with the landowner prior to the lease expiration date to ensure that the owners perform its obligations to remove its property and restore the premises. Within twelve (12) months of initiating the decommissioning, the project owners will have removed the relevant components from the leased land.

The decommissioning of the McLean's Mountain Wind Farm will follow the Ontario Health and Safety Act along with any applicable municipal, provincial and federal regulations and standards. As with the construction, a manager responsible for safety will be present on site for the duration of the work.

7.3.1 Decommissioning During Construction (Abandonment of Proposed Project)

While not expected, and considered to be extremely unlikely, in the event that construction of the proposed project and associated work may not be completed, the project would be decommissioned in a manner as described in this report. Further, mitigation measures as described in the Environmental Management and Protection Plan (part of the Design and Operations Report) would be implemented.

7.3.2 Decommissioning After Ceasing Operation

Properly maintained wind turbines have an expected life of thirty (30) years. At the end of the project life, depending on market conditions and project viability, the wind turbines may be 're-powered' with new nacelles, towers, and/or blades. Alternatively, the wind turbines may be decommissioned. Decommissioning activities such as removal of cables and access roads will be conducted in consultation with land owners.

In the event the project requires decommissioning, the following sequence for the removal of the components will be used:

- Remove above ground collection and transmission system including substation and switchyard;
- Remove wind turbines;
- Partial removal of wind turbine foundations; and
- Remove turbine access roads, if required by landowners.

This decommissioning plan is based on current procedures and experience. These procedures may be subject to revision based on new experiences and requirements.

7.3.3 Wind Turbines

The first stage of the disassembly will be to have wiring crews disconnect the tower from the collection system and disconnect the wiring between turbine sections. A crane will then, supported by a disassembly crew, remove the blades, the rotor, nacelle and then the towers section by section. The lubricating oil will be drained from the generator once it has been placed on the ground, and the oil will be disposed of in accordance with O.Reg 347. As the turbine is being disassembled, the various components will be transported off site.

7.3.4 Wind Turbine Foundations

Once all the turbine components have been cleared from a site, the top metre of overburden around the foundation will be excavated and stockpiled. Once cleared, the top metre of the foundation (or to bedrock) will be demolished. The resulting concrete and rebar will be hauled off site and disposed of at an off-site licensed facility. Afterwards, the stockpiled soil will be used to replace the now cleared area. The disturbed area will be feathered out and graded. No off site soil is predicted to be needed.

7.3.5 Access Road Removal

Access roads will be left at landowner's requests or graded to restore terrain profiles (as much as possible), and vegetated.

7.3.6 Cable Wire and Trench Decommissioning

If environmentally appropriate at the time of decommissioning, the underground cables will be left in place.

Overhead collection and transmission systems will be removed, including conductors and poles. The submarine portion of the transmission line will be removed using best practices at the time of decommissioning.

7.3.7 Electrical Substation Decommissioning

The substation electrical components (e.g. GSU, cable, cooling equipment, etc) will be either removed as a whole or disassembled, pending reuse or recycling. Once cleared. The gravel around the yard will be reclaimed (unless the land owner wishes to keep the area as is) and the fence removed. As with the turbine foundation, the substation foundation will be excavated and the top 1 m of concrete (or to bedrock) will be demolished and hauled off site to be properly disposed off. The excavated area will then be filled in native soil and will be re-graded. Any material that has been used as a sound attenuating berm will be leveled and replanted, using native species, to the requirements of the land holder.

7.3.8 Crane Pad Decommissioning

Crane pads will be approximately 200 m2 and consist of compacted native material. Approximately 300-600 mm of base fill is expected to be used for the crane pads. After decommissioning, the crane pad aggregate will be removed and areas will be filled unless the land holder asks for it to remain.

7.3.9 Restoration of Land and Water Negatively Affected by Facility

Once all of the turbines and ancillary facilities are removed, the remaining work to complete the decommissioning of the Project will consist of shaping and grading of the areas to as near as practicable to the original contour prior to construction of the wind turbines and access roads. All areas, including the access roads, transformer pads and crane pads will be restored as near as practical to their original condition with native soils and seeded.

Other than the concrete, which will remain three feet below the soil at the depth of the native bed rock or, no other residual impact is foreseen. The decommissioning will affect the agricultural practices directly around the access roads, substation and turbine locations, but only during their removal.

The most significant risk to the aquatic environment will be when the access roads near drains or municipal drain crossings are removed. Similar to the construction phase, the plant decommissioning will follow a storm water protection plan that will ensure proper steps are followed to mitigate erosion and silt/sediment runoff.

As with the project's construction, noise levels around the decommissioning work will be higher than average. Proper steps will be followed to minimize this disturbance, such as working only during daylight hours. Also, as with the project's construction, road traffic in the area will increase temporarily due to crews and heavy equipment movements.

7.3.10 Procedures for Managing Waste and Materials

The major components of the wind turbines (tower, nacelle, blades) are modular items that allow for ease of construction and disassembly of the wind turbines during replacement or decommissioning. Dismantled wind turbines have a high salvage value due to the steel and copper components. These components are easily recyclable and there is a ready market for scrap metals. Transformers and transmission lines are designed for a 50 year lifespan so these items could be refurbished and sold for reuse.

Based on the construction details for the GE wind turbines and associated tower and components, it is assumed that both the tower and nacelle will yield approximately 80% salvageable materials. Since the hub assembly and bedplate is manufactured steel, it is anticipated that the hub will yield 100% salvageable metallic materials. Copper salvage estimates were derived by assuming 5% of the total tower and nacelle weight consists of salvageable copper bearing materials. Since the rotor/blades are constructed of predominantly non-metallic materials (fiberglass reinforced epoxy and carbon fibers), no salvage for the rotor or blades is currently assumed.

It is assumed that 75% of the aggregate material from the decommissioning of the crane pads can be salvaged for future use as aggregate base course. It is also assumed that 50% of the aggregate base course could be reused as aggregate base course. The remaining materials would be viable for general fill on non-structural fill areas. The geotextile fabric cannot be salvaged.

7.3.11 Emergency Response and Communications Plans

The Emergency Response and Communications Plans are included in Section 8 of the Design and Operations Report prepared as part of the Renewable Energy Approval application for the proposed McLean's Mountain Wind Farm Project.

7.3.12 Decommissioning Notification

The process for notification of decommissioning activities will be the same as the process for notification of construction activities and is detailed in Section 8.1 of the Emergency Response and Communications Plans in the Design and Operations Report prepared as part of the Renewable Energy Approval application for the proposed McLean's Mountain Wind Farm Project.

8. Existing Environmental Conditions of Relevant Natural Features

Existing environmental conditions for the project location and surrounding areas was determined through the records review and site investigation, which comply with Section 25 and 26 of the *REA* process. Below, we provide a summary of the natural environment associated with the project location with a specific focus on natural features of significance that require an Environmental Impact Study. The function, composition, attributes and characteristics that make natural features significant, contribute to their persistence, may be sensitive to development and serve as a good indicator of negative environmental effects are described below.

8.1 Overview

Through the records review and site investigation work it was confirmed that the following natural features did not occur in the project location or relevant adjacent lands, or were not required to be evaluated for their significance:

- Provincial Parks and Conservation Reserves;
- ANSI, Life Science;
- ANSI, Earth Science;
- Valleylands;
- Provincial Plan Areas; and
- Woodlands.

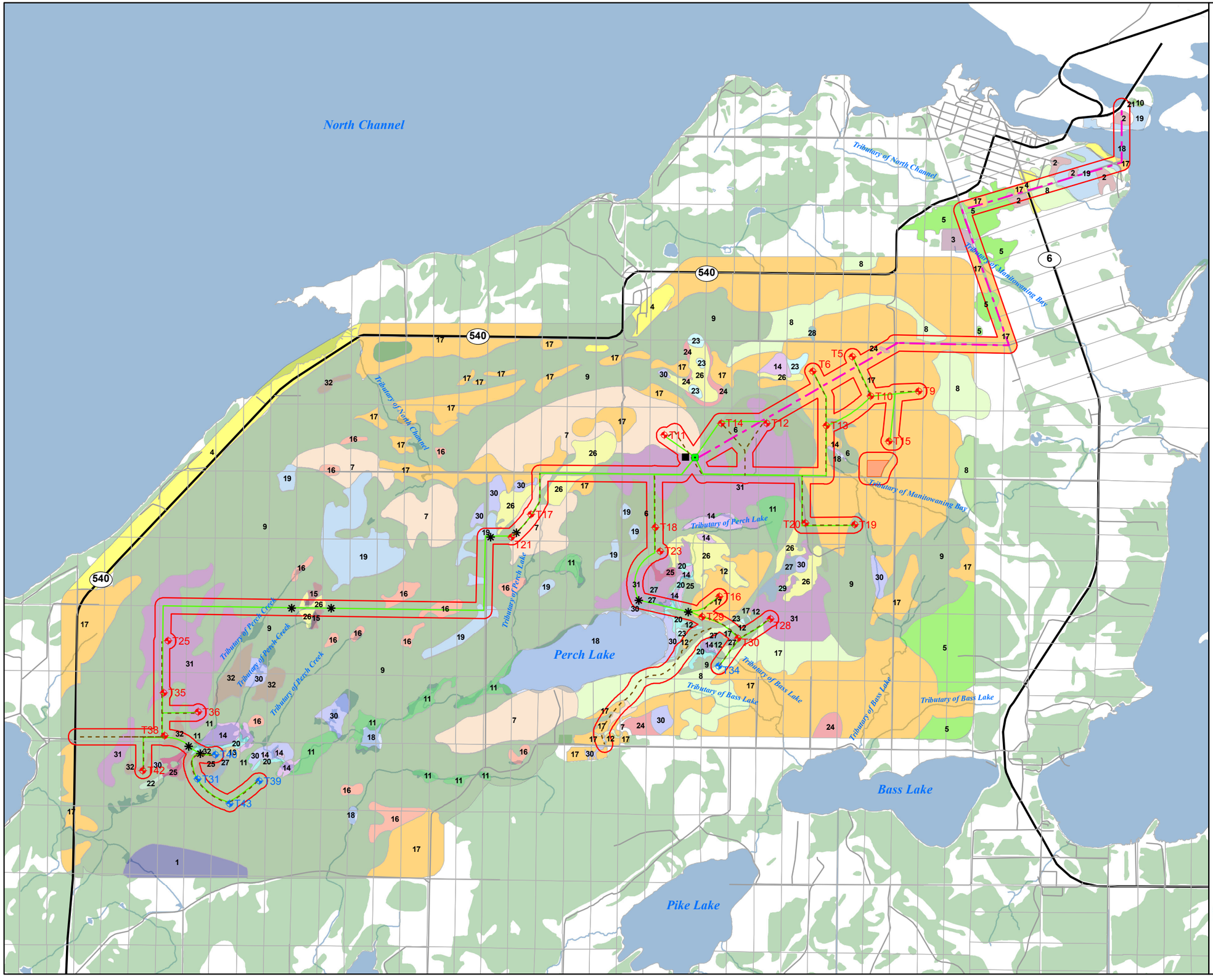
Although woodlands were identified as a common natural feature throughout the project location and adjacent areas, it does not require an EIS as this natural feature is within the Canadian Shield; Figure 1 in the *Provincial Policy Statement, 2005*. However, certain wildlife habitat functions of woodlands (e.g. Area Sensitive Forest Breeding Bird Habitat, etc.) are evaluated as part of significant wildlife habitat.

8.2 Ecological Land Classification

A total of twenty-five natural vegetation communities were observed in the areas within and adjacent to the project location; of these, twenty-one fall within 120 m of the project location. The location, type and boundaries of all vegetation communities are delineated on **Figure 3**. A

photographic record of vegetation communities is provided in Appendix D (of the Site Investigation Report).

Open fields within the project location and surrounding areas are primarily used as pastureland for cattle. Five units of Common Juniper Shrub Alvar were identified within the project location. This rare vegetation community is considered *Vulnerable* in Ontario with an SRank of S3. These communities are located along Sideroad 20 and Greenbush Road in proximity to feeder lines as well as Harbourview Road and on Goat Island in proximity to the transmission line (see **Figure 3**). Soils in the project location were found to be shallow. This is in agreement with Ontario soil mapping for the general study area, which indicates the dominant soil is Farmington Loam. This type of soil consists of shallow loam textured calcareous tills over limestone bedrock and is generally less than 30 cm deep (Canada Department of Agriculture and Ontario Agricultural College 1959).



NORTHLAND POWER

McLean's Mountain Wind Farm
Figure 3: Ecological Land Classification Map

Legend

- Local Roads
- Highway
- Watercourse
- 120m Project Component Setback
- Lots/Concessions
- Water Body
- Woodland

Ecological Land Classification (Based on Community Code)

- 1) BO: Bog
- 2) CVC_2: Light Industrial
- 3) CVI_3: Sewage and Water Treatment
- 4) CVR_1: Low Density Residential
- 5) FOD: Deciduous forest
- 6) FODM1: Dry-Fresh Oak Deciduous Forest
- 7) FODM5-1: Dry-Fresh Sugar Maple Deciduous Forest
- 8) FODM8-1: Fresh-Moist Poplar Deciduous Forest
- 9) FOMM10: Fresh-Moist Spruce Fir – Hardwood Mixed Forest
- 10) FOMM4: Dry-Fresh White Cedar Mixed Forest
- 11) MAMM1: Graminoid Mineral Meadow Marsh
- 12) MAMM3: Mixed Mineral Meadow Marsh
- 13) MASM1: Graminoid Mineral Shallow Marsh
- 14) MASM1-1: Cattail Mineral Shallow Marsh
- 15) MASM1-14: Reed Canary Grass Mineral Shallow Marsh
- 16) ME: Meadow
- 17) OAGM4: Open Pasture
- 18) OAO: Open Water
- 19) RBSA1-1: Common Juniper Shrub Alvar
- 20) SWCM1-2: White Cedar-Conifer Coniferous Swamp
- 21) SWDM2: Ash Mineral Deciduous Swamp
- 22) SWDM2-1: Black Ash Deciduous Swamp
- 23) SWDM2-2: Green Ash Deciduous Swamp
- 24) SWDM3: Maple Mineral Deciduous Swamp
- 25) SWDM4-5: Poplar Deciduous Swamp
- 26) SWMM1-1: White Cedar-Hardwood Mixed Swamp
- 27) SWMM3-2: Poplar-Conifer Mixed Swamp
- 28) SWMM4: Ash Mixed Swamp
- 29) SWTM2-5: Red-Osier Dogwood Mineral Deciduous Swamp
- 30) SWTM3: Willow Mineral Deciduous Thicket Swamp
- 31) TAGM4: Treed Pasture
- 32) WODM5-1: Fresh-Moist Poplar Deciduous Woodland

Project Components

- 24 Wind Turbine Lcoations
- Five Extra Permitted Sites
- Substation
- Operations Building
- Horizontal Directional Drilling Access/Exit Pit
- Transmission Line
- Access Road
- Feeder Lines
- Construction Staging Area

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8.3 Vegetation Survey

In total, 246 flora species were identified during the site investigation (a full list of species encountered is included in Appendix E, Table E1 of the Site Investigation Report). In general, active pastureland and old field contain lower biodiversity with fewer high conservation coefficient species based on fieldwork. During the site investigations of the project location and 120 m setback areas, two species of conservation concern were identified, including Slender Blazing Star (*Liatris cylindrica*) and Cooper's Milkvetch (*Astragalus neglectus*). Slender Blazing Star was observed in association with the Alvar 4 community located on Lot 22, Con 12 east of Highway 6. Cooper's Milkvetch was observed in the Fresh-Moist Spruce/Fir-Hardwood Mixed Forest community in proximity to Turbine 30.

8.4 Wetlands

Several units of unevaluated southern wetlands were identified during the records review within 120 m of the project location. In addition, several more wetlands were identified through fieldwork conducted in late 2010 and 2011. In total, 12 wetland units have been identified within 120 m of the project location. Of these 12 wetland units, 10 wetlands are assumed to be provincially significant using the wetland characteristics and ecological functions assessment (MNR December 2010), and two wetlands were evaluated to be non-provincially significant. The boundaries of these 12 wetlands were delineated using the OWES protocol during the site investigation work and shown on **Figure 4**. **Table 3** outlines the attributes, composition and function of each wetland unit identified during the site investigation found to be within 120 m of the project location and confirms if the wetland was included in the records review or was identified as a result of these site investigations. **Table 3** also outlines the project components that fall within 120 m of each wetland boundary.

NORTHLAND POWER

McLean's Mountain Wind Farm
Figure 4: Wetland Identification

Legend

- Local Roads
- Highway
- 120 m Project Location Setback
- Lots/Concessions
- Water Body
- Watercourse
- 1 — Assumed Provincially Significant Wetlands
- 1 — Non-Provincially Significant Wetlands
- Woodland*
- Unevaluated Wetland Outside of the 120m Project Component Setback*

Project Components

- 24 Wind Turbine Locations
- Five Extra Permitted Sites
- Substation
- Operations Building
- Horizontal Directional Drilling Access/Exit Pit
- Transmission Line
- Access Road
- Feeder Lines
- Construction Staging Area

*Produced by Dillon Consulting under licence from Ontario Ministry of Natural Resources, Copyright (c) Queens Printer 2011.

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File Path: I:\GIS\091983 - Northland Power\Mapping\Site Investigation Report\062211\ Figure 10 Wetland and Woodland Identification 070611.mxd

Table 3: Summary of Wetlands within 120 m of the Project Location

Wetland ID	Wetland Identified during Records Review?	Attributes		Composition		Function		Project Components within 120 m
		Size (hectares)	Distance to nearest wetland unit	Relevant Species	ELC Communities	Associated Candidate Wildlife Habitat*	Hydrologic Connection	
1	✓	87.4	15 m from an unevaluated wetland	*Typha latifolia*, *Salix* spp., *Thuja occidentalis, Spirea* spp., *Phalaris arundinacea,* Sedge spp., *Picea glauca, Abies balsamea, Populus tremuloides, Populus grandidentata*, *Cornus stolonifera*, *Alnus incana*, Grass spp.	Willow Mineral Deciduous Thicket Swamp, Poplar Deciduous Swamp, Cattail Mineral Shallow Marsh, White Cedar-Conifer Coniferous Swamp, Poplar-Conifer Mixed Swamp, Willow Mineral Deciduous Thicket Swamp	Woodland Amphibian Breeding Habitat, Waterfowl Nesting Area, Turtle Overwintering Area and Bullfrog Concentration Area.	Perch Creek, downstream of Perch Lake, also receives water from Perch Creek tributaries	Access Road, Feeder Lines, Turbines
2	☒	17.4	122 m from an unevaluated wetland	*Thuja occidentalis*, *Abies balsamea*, *Picea glauca*, *Populus balsamifera*, *Fraxinus nigra*, *Phalaris arundinacea*,	Reed Canary Grass Mineral Shallow Marsh, White Cedar-Hardwood Mixed Swamp	Woodland Amphibian Breeding Habitat, Turtle Overwintering Area and Bullfrog Concentration Area.	Head waters of tributary to Perch Creek	Feeder Line
3	☒	31.6	5 m from an unevaluated wetland	*Thuja occidentalis, Abies balsamea, Larix laricina, Populus tremuloides, Betula papyrifera, Salix* spp., *Fraxinus nigra*	White Cedar-Hardwood Mixed Swamp, Willow Mineral Deciduous Thicket Swamp	Woodland Amphibian Breeding Habitat, Turtle Overwintering Area, Bullfrog Concentration Area., Sites Supporting Area-sensitive Species: Forest Birds and Reptile Hibernacula.	May contribute to a tributary of Perch Lake	Access Road, Feeder Lines, Turbines
4	☒	13.9	6 m from unit 5	*Thuja occidentalis, Picea glauca, Populus balsamifera, Fraxinus nigra, Alnus incana, Cornus stolonifera*	White Cedar-Hardwood Mixed Swamp	Woodland Amphibian Breeding Habitat.	Head waters of tributary to Perch Lake	Access Road, Feeder Line
5	☒	29.3	6 m from unit 4	*Thuja occidentalis, Picea glauca, Populus balsamifera, Fraxinus nigra, Alnus incana, Cornus stolonifera*	White Cedar-Hardwood Mixed Swamp	Woodland Amphibian Breeding Habitat, Turtle Overwintering Area, Bullfrog Concentration Area and	Head waters of tributary to Perch Lake	Access Road, Feeder Line
6	☒	210.7	28 m from an unevaluated wetland	*Salix* spp., *Myrica gale, Cornus stolonifera, IGeum avens, Thuja occidentalis, Picea glauca, Abies balsamea,Fraxinus pennsylvanica, Populus tremuloides, Populus grandidentata, Larix laricina, Carex vulpinoidea*., *Scirpus atrovirens*, *Typha latifolia*, *Phalaris arundinacea*	Willow Mineral Deciduous Thicket Swamp, White Cedar-Conifer Coniferous Swamp, Green Ash Deciduous Swamp, Cattail Mineral Shallow Marsh, Poplar Deciduous Swamp, White Cedar-Hardwood Mixed Swamp	Woodland Amphibian Breeding Habitat, Turtle Overwintering Area, Bullfrog Concentration Area and Waterfowl Nesting Area,	Palustrine wetland connected to Perch Lake	Feeder Line, Turbine, Access Road
7	✓	39.3	158m from unit 5	*Thuja occidentalis, Picea glauca, Abies balsamea, Populus tremuloides, Typha latifolia*, *Carex bebbiana, C. granularis, Scirpus atrovirens, Calamagrostis canadensis; Hieracium caespitosum,*	Cattail Mineral Shallow Marsh, White Cedar-Conifer Coniferous Swamp, Mixed Mineral Meadow Marsh, Poplar-Conifer Mixed Swamp	None	Palustrine wetland connected to Bass Lake	Access Road, Feeder Lines, Turbines

Wetland ID	Wetland Identified during Records Review?	Attributes		Composition		Function		Project Components within 120 m
		Size (hectares)	Distance to nearest wetland unit	Relevant Species	ELC Communities	Associated Candidate Wildlife Habitat*	Hydrologic Connection	
8	☒	0.1	11 m from unit 7	*Carex utriculata, Carex vulpinoidea; Mentha spicata*	Mixed Mineral Meadow Marsh	Raptor Winter Feeding and Roosting Area	Head waters of tributary to Bass Lake	Access Road,
9	☒	0.3	11 m from unit 8	*Ceratophyllum spp.; Scirpus atrovirens, Carex vulpinoidea; Typha latifolia, Scirpus validus*	Mixed Mineral Meadow Marsh, Open water	Raptor Winter Feeding and Roosting Area	Head waters of tributary to Bass Lake	Access Road,
10	☒	2.0	39 m from unit 8	*Salix spp., Cornus stolonifera;*	Willow Mineral Deciduous Thicket Swamp	None	Head waters of tributary to Bass Lake	Access Road,
11	☒	1.0	1,049 m from an unevaluated wetland	*Typha latifolia; Scirpus atrovirens, Carex comosa, C. vulpinoides, Phalaris arundinacea*	Cattail Mineral Shallow Marsh,	Raptor Winter Feeding and Roosting Area	Head waters of tributary to Manitowaning Bay	Access Road, Feeder Line
12	☒	0.6	1,049 m from an unevaluated wetland	*Acer freemanii, Fraxinus pennsylvanica; Typha latifolia; Pharis arundinacea*	Maple Mineral Deciduous Swamp	Woodland Amphibian Breeding Habitat, Raptor Winter Feeding and Roosting Area and Sites Supporting Area-Sensitive Species: Open Country Breeding Birds	Isolated wetland with no know connectivity	Transmission Line

8.5 Wildlife Habitat

The occurrence and significance of wildlife habitat was assessed using the Significant Wildlife Habitat Technical Guide (MNR 2000). Wildlife habitat was evaluated by applying the criteria found within the above technical guide and its' associated appendices, to the site conditions in the project location and surrounding lands. Based on this evaluation significant wildlife habitat identified as occurring within 120 m of the project location that require an Environmental Impact Study includes:

- Seasonal Concentration Areas
  - Waterfowl Nesting; and
  - Raptor Winter Feeding and Roosting
- Rare Vegetation Communities
  - Common Juniper Shrub Alvar;
- Specialised Habitat for Wildlife
  - Woodland Amphibian Breeding Habitat;
  - Turtle Over-wintering Area;
  - Sites Supporting Area-sensitive Species: Forest Birds; and
  - Sites Supporting Area-sensitive Species: Open Country Breeding Birds
- Habitat of Species of Conservation Concern
  - Species of Conservation Concern (Short-eared Owl, Common Snapping Turtle, Cooper's Milkvetch, Slender Blazing Star, Clustered Broomrape, and Prairie Dropseed)

Table 4 outlines the attributes, composition and function of each significant wildlife habitat and the distance of project components that fall within 120 m of each wetland boundary. With exception to Cooper's Milkvetch (*Astragalus neglectus*), Slender Blazing Star (*Liatris spicata*), Clustered Broomrape (*Orobanche fasciculata*) and Prairie Dropseed (*Sporobolus heterolepis*), species of conservation concern are evaluated as part of other wildlife habitat categories below. Characteristics that contribute to wildlife habitat persistence, may be sensitive to development and serve as a good indicator of negative environmental effects are described below in **Section 9**.

Table 4: Wildlife Habitat in the Project Location and Surrounding 120 m

Wildlife Habitat	Attributes*	Composition	Function	Relevant Evaluation Criteria Determining Status	Project Components within 120 m	Nearest Distance to project location
Waterfowl Nesting Area – WNA 1	Waterfowl nesting areas are associated with wetland and woodlands located in upland areas. Upland areas associated with ELC ecosites MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, and SWD4.	This 104 ha unit contains 19.9 ha of Cattail Mineral Shallow Marsh, 7 ha of Poplar Deciduous Swamp, 5.9 ha of White-Cedar Conifer Coniferous Swamp, 3.1 ha of Black Ash Deciduous Swamp, 2.8 ha of Graminoid Mineral Shallow Marsh, 2.2 ha of Poplar-Conifer Mixed Swamp and 1.8 ha of Graminoid Mineral Meadow Marsh habitat surrounded by 51.6 ha of Fresh-Moist Spruce Fir – Hardwood Mixed Forest, 7.4 ha of Fresh-Moist Poplar Deciduous Woodland and 1.4 ha of Meadow (**Figure 3** and **5**).	Waterfowl Nesting Area	Low waterfowl species diversity and low numbers of individuals were observed during 2007, 2008 and 2009 breeding season surveys. No waterfowl species of conservation concern were observed. A large amount of similar habitat is present throughout Manitoulin Island. There is no indication that the project location contains special attributes, composition or function that would make it rare in the planning area. Additional pre-construction surveys will be necessary to properly assess the utilization of this specific habitat for waterfowl nesting.	Feeder Line and Access Road	Within project location
Waterfowl Nesting Area – WNA 4	Waterfowl nesting areas are associated with wetland and woodlands located in upland areas. Upland areas associated with ELC ecosites MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, and SWD4.	This 89 ha unit contains 13.7 ha of Willow Mineral Deciduous Thicket Swamp, 12 ha of White Cedar-Conifer Coniferous Swamp, 5 ha of Cattail Mineral Shallow Marsh, 3.4 ha of Poplar-Conifer Mixed Swamp, 1.7 ha of Green Ash Deciduous Swamp and 1.1 ha of Mixed Mineral Meadow Marsh habitat surrounded by 18.3 ha of Open Water, 16.6 ha of Fresh-Moist Spruce Fir – Hardwood Mixed Forest, 10.5 ha of Tree Pasture, 5.6 ha of Fresh-Moist Poplar Deciduous Forest and 1 ha of Open Pasture (**Figure 3** and **5**).	Waterfowl Nesting Area	Low waterfowl species diversity and low numbers of individuals were observed during 2007, 2008 and 2009 breeding season surveys. No waterfowl species of conservation concern were observed. A large amount of similar habitat is present throughout Manitoulin Island. There is no indication that the project location contains special attributes, composition or function that would make it rare in the planning area. Additional pre-construction surveys will be necessary to properly assess the utilization of this specific habitat for waterfowl nesting.	Feeder Line	Within project location
Waterfowl Nesting Area – WNA 5	Waterfowl nesting areas are associated with wetland and woodlands located in upland areas. Upland areas associated with ELC ecosites MAS1, MAS2, MAS3, SAS1, SAM1, SAF1, MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SWT1, SWT2, SWD1, SWD2, SWD3, and SWD4.	This 43.8 ha unit contains 10.1 ha of Cattail Mineral Shallow Marsh, 5.8 ha of Green Ash Deciduous Swamp and 4.9 ha of White Cedar – Hardwood Mixed Swamp habitat surrounded by 19.4 ha of Open Pasture, 1.9 ha of Fresh-Moist Spruce Fir – Hardwood Mixed Forest and 1.8 ha of Fresh-Moist Poplar Deciduous Forest (**Figure 3** and **5**).	Waterfowl Nesting Area	No waterfowl species were observed. A large amount of similar habitat is present throughout Manitoulin Island. There is no indication that the project location contains special attributes, composition or function that would make it rare in the planning area.	Turbine 6, Feeder Line and Access Road	40 m to Turbine 6
Raptor Winter Feeding and Roosting Area RWFR 3	Open fields, hayfields, pastures and meadows that support large and productive small mammal populations with a diversity of herbaceous vegetation providing food for mammals. Windswept fields that are not covered by snow are preferred for hunting. Roosting sites are likely to be found in mature mixed or coniferous woodlands. Combination of ELC codes	This unit contains 611.13 ha of open pasture areas and a buffer of 120 m inside adjacent wooded areas (**Figure 3 and 6**). Cows do graze in this area during certain times of the year. Overall the area is minimally disturbed. Open Pasture: 431.70 surrounded by Deciduous Forest: 29 ha; Fresh-Moist Poplar Deciduous Forest: 97 ha; Fresh-Moist Spruce Fir – Hardwood Mixed Forest: 20.6 ha; Maple Mineral Deciduous Swamp: 17.3 ha; Dry-Fresh Sugar Maple Deciduous Forest: 7 ha; Mixed Mineral	Winter foraging and roosting	Raptors observed in low numbers during winter surveys. Field observations confirmed that raptor density and use of the project location was extremely low. However, in 2010 Short-eared owls were observed using open country in the area north west of McLean's Mountain Road and Greenbush Road intersection. Observations suggest that this species uses the area infrequently. Pre-construction surveys will be required to assess the utilization of this specific habitat unit as a raptor winter feeding and roosting area with a special focus on Short-eared Owls.	Turbine 34, Feeder Line and Access Roads	Within project location

Wildlife Habitat	Attributes*	Composition	Function	Relevant Evaluation Criteria Determining Status	Project Components within 120 m	Nearest Distance to project location
	from forest class (FOC, FOD, and FOM) and upland class (CUM, CUT, CUS, and CUW).	Meadow Marsh: 0.2 ha; Open Water: 0.12 ha; and Willow Mineral Deciduous Thicket Swamp; 7.8 ha. Red-tailed Hawk (1)				
Raptor Winter Feeding and Roosting Area RWFR 4	Open fields, hayfields, pastures and meadows that support large and productive small mammal populations with a diversity of herbaceous vegetation providing food for mammals. Windswept fields that are not covered by snow are preferred for hunting. Roosting sites are likely to be found in mature mixed or coniferous woodlands. Combination of ELC codes from forest class (FOC, FOD, and FOM) and upland class (CUM, CUT, CUS, and CUW).	This 1386.72 ha unit contains open pasture areas and a buffer of 120 m inside adjacent wooded areas (**Figure 3 and 6**). Cows do graze in this area during certain times of the year. Overall the area is minimally disturbed. Open Pasture: 1001.9 ha surrounded by Deciduous Forest: 21 ha; Dry-Fresh Oak Deciduous Forest: 44 ha; Fresh-Moist Poplar Deciduous Forest: 101.8 ha; Fresh-Moist Spruce Fir – Hardwood Mixed Forest: 99.2 ha; Cattail Mineral Shallow Marsh: 8.7 ha; Green Ash Deciduous Swamp: 5.9 ha; Maple Mineral Deciduous Swamp: 5.5 ha; White Cedar – Hardwood Mixed Swamp: 11.4 ha; and Willow Mineral Deciduous Thicket Swamp: 5.5 ha. Red-tailed Hawk (1); Short-eared Owl (2)	Winter foraging and roosting	Red-tailed hawk and short-eared owl observed in low numbers during winter surveys. Field observations confirmed that raptor density and use of the project location was extremely low. The occurrence of 2 Short-eared Owls in the winter of 2010 represents the first sightings for this species in the study area between 2004 and 2010. Observations suggest that this species uses the area infrequently. Pre-construction surveys will be required to assess the utilization of this specific habitat unit as a raptor winter feeding and roosting area.	Turbines 5, 6, 9, 10, 13, 15, 19 and 20; Feeder Lines and Access Roads.	Within project location
Alvar - ALV 1	Naturally open areas of thin soil over flat limestone, dolostone or marble rock supporting a sparse vegetation of shrubs and herbs. Trees are often absent or scattered. Vegetation is adapted to extreme variations in temperature and soil moisture. ELC ecosite ALO1, ALS1 and ALT1.	This unit contains 22.7 ha of Common Juniper Shrub Alvar habitat surrounded by hardwood mixed forest (**Figure 3** and **7**).	Habitat for alvar adapted species	Considered a rare vegetation community. Prairie smoke (*Geum triflorum*) was abundant within this habitat unit. This species is listed as a vascular plant indicative of Alvar habitats in Ontario (Appendix M and N of the SWHTG, MNR 2000).	Feeder Line	Within project location
Alvar - ALV 2		This unit contains 3.6 ha of Common Juniper Shrub Alvar habitat surrounded by hardwood mixed forest (**Figure 3** and **7**).	Habitat for alvar adapted species	Considered a rare vegetation community. Prairie smoke (*Geum triflorum*) was observed occasionally within this vegetation community. This species is listed as a vascular plant indicative of Alvar habitats in Ontario (Appendix M and N of the SWHTG, MNR 2000).	Feeder Line	Within project location
Alvar - ALV 3		This unit contains 15 ha of Common Juniper Shrub Alvar habitat surrounded by hardwood mixed forest (**Figure 3** and **7**).	Habitat for alvar adapted species	Considered a rare vegetation community. Prairie smoke (*Geum triflorum*) was observed occasionally within this vegetation community. This species is listed as a vascular plant indicative of Alvar habitats in Ontario (Appendix M and N of the SWHTG, MNR 2000).	Feeder Line and Access Road	Within project location
Alvar - ALV 4		This unit contains 38.2 ha of Common Juniper Shrub Alvar habitat surrounded by light industrial area, low density residential area and deciduous forest (**Figure 3** and **7**).	Habitat for alvar adapted species	Considered a rare vegetation community. Prairie smoke (*Geum triflorum*) was observed occasionally within this vegetation community. This species is listed as a vascular plant indicative of Alvar habitats in Ontario (Appendix M and N of the SWHTG, MNR 2000). Slender blazing star, a species of conservation concern, was observed along the northeast side of Harbourview Road just outside of the road right-of-way.	Transmission Line	Within project location

Wildlife Habitat	Attributes*	Composition	Function	Relevant Evaluation Criteria Determining Status	Project Components within 120 m	Nearest Distance to project location
Woodland Amphibian Breeding Habitat - WABH1	Ponds used by several species of frogs and salamanders. The best breeding ponds are unpolluted and contain a variety of vegetation structure in and around the edge of the pond for egg-laying and calling by frogs. Closed-canopy woodlands with rather dense undergrowth maintaining a damp environment are preferred. Moist fallen logs are an important habitat component required for salamanders. Sites with several ponds and/or ponds close to creeks are valuable. Associated with ELC ecosites FOC, FOM, FOD, SWC, SWM and SWD.	This narrow unit contains 9.9 ha of Black Ash Deciduous Swamp and Poplar Deciduous Swamp habitat adjacent to Hardwood Mixed Forest and Fresh-Moist Poplar Deciduous Forest (**Figure 3** and **8**). A tributary of Perch Creek flows through this unit which provides permanent water and standing pool areas.	Breeding habitat	Suitable habitat was observed upstream of a beaver dam. Habitat downstream is less suitable due to flowing water (Perch Creek). Full chorus of Northern Leopard Frog observed as well as a large population of Spring Peepers. Tadpoles observed in the area (potentially Green Frog). No egg masses observed.	Feeder Line and Access Road	65 m from Feeder Line and Access Road
Woodland Amphibian Breeding Habitat – WABH 2		This small unit contains 5.9 ha of Poplar Deciduous Swamp and Poplar-Conifer Mixed Swamp habitat adjacent to Fresh-Moist Poplar Deciduous Woodland and Hardwood Mixed Forest (**Figure 3** and **8**). This unit contains pockets of permanent open water.	Breeding habitat	Numerous small pools present within swamp habitat, approximately 15 cm deep. Most of these pools do not have dense vegetation but have leaf litter and woody debris. Wood Frog observed. Full chorus of Northern Leopard Frog heard in the area as well as a large population of Spring Peepers during daytime area surveys.	Turbine 40, Feeder Line and Access Road	40 m from Turbine 40
Woodland Amphibian Breeding Habitat – WABH 5		This unit contains 18.6 ha of White Cedar – Hardwood Mixed Swamp habitat adjacent to Dry-Fresh Sugar Maple Deciduous Forest (**Figure 3** and **8**). This unit contains pockets of permanent open water.	Breeding habitat	Suitable woodland breeding area within swamp habitat. Wood Frogs, Spring Peeper (full chorus), Gray Treefrog (full chorus), Green Frog and a Bullfrog were observed during nocturnal marsh monitoring surveys.	Feeder Line and Access Road	25 m from Feeder Line
Woodland Amphibian Breeding Habitat – WABH 6		This unit contains 43.2 ha of White Cedar – Hardwood Mixed Swamp habitat adjacent to Dry-Fresh Sugar Maple Deciduous Forest and Hardwood Mixed Forest (**Figure 3** and **8**). This unit contains pockets of permanent open water.	Breeding habitat	Suitable woodland breeding area within swamp habitat. Wood Frogs, Spring Peeper (full chorus), Gray Treefrog (full chorus), Green Frog and American Toad observed during nocturnal marsh monitoring surveys.	Feeder Line and Access Road	30 m from Feeder Line
Woodland Amphibian Breeding Habitat – WABH 7		This unit contains 2.7 ha of Poplar - Conifer Mixed Swamp habitat adjacent to Treed Pasture (**Figure 3** and **8**). This unit contains pockets of permanent open water.	Breeding habitat	Suitable woodland breeding area within swamp habitat. Green Frogs, Spring Peepers and Northern Leopard Frogs observed (individuals) during daytime area searches.	Feeder Line	70 m from Feeder Line
Woodland Amphibian Breeding Habitat – WABH 8		This unit contains 54.1 ha of White Cedar – Hardwood Mixed Swamp and Poplar Deciduous Swamp habitat adjacent to Treed Pasture and Hardwood Mixed Forest (**Figure 3** and **8**). This unit contains pockets of permanent open water.	Breeding habitat	Suitable woodland breeding area within swamp habitat. Wood Frog, Green Frog and Northern Leopard Frog observed (individuals) during daytime area searches.	Turbine 23, Feeder Line and Access Road	95 m from Turbine 23
Turtle Overwintering Areas - TOA 1	Permanent water bodies, large wetlands, bogs or fens with adequate dissolved oxygen. Associated with ELC ecosites MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1 SAM1, SAF1, BOO1 and FEO1.	This unit contains 37.8 ha of contiguous Cattail Mineral Shallow Marsh, White Cedar-Conifer Coniferous Swamp, Poplar Deciduous Swamp, Poplar-Conifer Mixed Swamp and Willow Mineral Deciduous Thicket Swamp habitat with permanent deep water areas (**Figure 3** and **9**). Deciduous woodland and hardwood mixed forest	Turtle Overwintering Habitat	Suitable deep open water areas provided in combined marsh and swamp habitat. An individual common snapping turtle, a species of conservation concern, was observed in the area of Turbine 38 in 2008.	Turbine 40, Feeder Line and Access Road	15 m from Feeder Line

Wildlife Habitat	Attributes*	Composition	Function	Relevant Evaluation Criteria Determining Status	Project Components within 120 m	Nearest Distance to project location
		characterize adjacent lands. A tributary of Perch Creek connects this unit to TOA 2 along Guida's Sideroad.				
Turtle Overwintering Areas - TOA 2	Permanent water bodies, large wetlands, bogs or fens with adequate dissolved oxygen. Associated with ELC ecosites MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1 SAM1, SAF1, BOO1 and FEO1.	This unit contains 16.3 ha of Reed Canary Grass Mineral Shallow Marsh, White Cedar-Hardwood Mixed Swamp with permanent deep water areas (**Figure 3** and **9**). Hardwood mixed forest characterizes adjacent land. A tributary of Perch Creek connects this unit to TOA 1 to the south.	Turtle Overwintering Habitat	Suitable deep open water areas provided in combined marsh and swamp habitat. An individual common snapping turtle, a species of conservation concern, was observed along Guida's Sideroad. A midland painted turtle was also observed.	Feeder Line	20 m from Feeder Line
Turtle Overwintering Areas - TOA 3	Permanent water bodies, large wetlands, bogs or fens with adequate dissolved oxygen. Associated with ELC ecosites MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1 SAM1, SAF1, BOO1 and FEO1.	This unit contains 31.6 ha of White Cedar-Hardwood Mixed Swamp and Willow Mineral Deciduous Thicket Swamp habitat with permanent deep water areas (**Figure 3** and **9**). Open pasture, Alvar, deciduous forest and hardwood mixed forest characterize adjacent land.	Turtle Overwintering Habitat	Suitable deep open water areas provided in swamp habitat. Common snapping turtle, a species of conservation concern, was observed in 2008 near the intersection of Greenbush Road and Sideroad 20.	Feeder Line and Access Road	25 m from Feeder Line
Turtle Overwintering Areas - TOA 4	Permanent water bodies, large wetlands, bogs or fens with adequate dissolved oxygen. Associated with ELC ecosites MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1 SAM1, SAF1, BOO1 and FEO1.	This unit contains 29.3 ha of White Cedar-Hardwood Mixed Swamp habitat with permanent deep water areas (**Figure 3** and **9**). Deciduous forest, Alvar, mixed swamp, open pasture and hardwood mixed forest characterize adjacent land.	Turtle Overwintering Habitat	Suitable deep open water areas provided in swamp habitat. No direct turtle observations were made in this area. Low numbers of Snapping Turtle and Midland Painted Turtle have been observed throughout the project location.	Feeder Line	15 m from Feeder Line
Turtle Overwintering Areas - TOA 5	Permanent water bodies, large wetlands, bogs or fens with adequate dissolved oxygen. Associated with ELC ecosites MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1 SAM1, SAF1, BOO1 and FEO1.	This unit contains 74.4 ha of Cattail Mineral Shallow Marsh, White Cedar-Conifer Coniferous Swamp, Poplar Deciduous Swamp, White Cedar-Hardwood Mixed Swamp with permanent deep water areas (**Figure 3** and **9**). Open pasture, treed woodland and hardwood mixed forest characterize adjacent lands. A tributary of Perch Lake flows through this unit connecting to TOA 7.	Turtle Overwintering Habitat	Suitable deep open water areas provided in combined marsh and swamp habitat. An individual Snapping Turtle was observed in the area.	Turbine 23, Feeder Line and Access Road	10 m from Feeder Line
Turtle Overwintering Areas - TOA 6	Permanent water bodies, large wetlands, bogs or fens with adequate dissolved oxygen. Associated with ELC ecosites MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1 SAM1, SAF1, BOO1 and FEO1.	This unit contains 47 ha of Cattail Mineral Shallow Marsh, White Cedar-Conifer Coniferous Swamp, Poplar Deciduous Swamp and White Cedar-Hardwood Mixed Swamp habitat with permanent deep water areas (**Figure 3** and **9**). Treed pasture and hardwood mixed forest characterize adjacent land.	Turtle Overwintering Habitat	Suitable deep open water areas provided in combined marsh and swamp habitat. No direct turtle observations were made in this area. Low numbers of Snapping Turtle and Midland Painted Turtle have been observed throughout the project location.	Turbine 20, Feeder Line and Access Road	119 m from Feeder Line
Turtle Overwintering Areas - TOA 7	Permanent water bodies, large wetlands, bogs or fens with adequate dissolved oxygen. Associated with ELC ecosites MAM1, MAM2, MAM3, MAM4, MAM5, MAM6, SAS1 SAM1, SAF1, BOO1 and FEO1.	Perch Lake represents 186.7 ha of contiguous, permanent open water habitat surrounded by deciduous and hardwood mixed forest, treed pasture and mixed mineral marsh habitat (**Figure 3** and **9**). Minimal shoreline and emergent vegetation is present. A tributary of Perch Lake connects this unit to TOA 5.	Turtle Overwintering Habitat	Largest permanent inland water body in the project location and general area. Suitable deep open water areas provided. An individual Snapping Turtle was observed in the area.	Feeder Line	85 m from Feeder Line

Wildlife Habitat	Attributes*	Composition	Function	Relevant Evaluation Criteria Determining Status	Project Components within 120 m	Nearest Distance to project location
Sites Supporting Area-Sensitive Species: Forest Birds FB 1	Most significant forest stands should contain at least 10 ha of interior forest excluding at least a 200 m buffer around the forest interior. Sites with abundant large, mature trees are more significant. Forests comprised of mainly closed canopy of large trees and a variety of vegetation layers tend to support a greater diversity of species due to the broad range of habitats provided. Minimum forest habitat is at least 100 m away from any edge habitat.	This unit contains 525.7 ha of interior Fresh – Moist Spruce Fir – Hardwood Mixed Forest habitat (**Figure 3** and **10**).	Breeding bird habitat	Large high quality area of interior forest habitat present. Area-sensitive interior nesting birds, as defined by Appendix G of the Significant Wildlife Habitat Technical Guide (MNR 2000) observed in this wildlife unit include: Black-and-white Warbler (2), Black-throated Green Warbler (4), , Hermit Thrush (2), Magnolia Warbler (1), Ovenbird (10), Red-breasted Nuthatch (2), Scarlet Tanager (3), and Veery (3).	Turbine 39 and 43; Feeder Line and Access Road	Within project location
Sites Supporting Area-Sensitive Species: Forest Birds FB 2	Most significant forest stands should contain at least 10 ha of interior forest excluding at least a 200 m buffer around the forest interior. Sites with abundant large, mature trees are more significant. Forests comprised of mainly closed canopy of large trees and a variety of vegetation layers tend to support a greater diversity of species due to the broad range of habitats provided. Minimum forest habitat is at least 100 m away from any edge habitat.	This unit contains 581.8 ha of interior Fresh – Moist Spruce Fir – Hardwood Mixed Forest habitat (**Figure 3** and **10**).	Breeding bird habitat	Large high quality area of interior forest habitat present. Area-sensitive interior nesting birds, as defined by Appendix G of the Significant Wildlife Habitat Technical Guide (MNR 2000) observed in this wildlife unit include: American Redstart (3), Canada Warbler (1), Hermit Thrush (1), Magnolia Warbler (4), Ovenbird (3), Veery (1), Winter Wren (3) and Hairy Woodpecker (2). Canada warbler, a species of conservation concern, was observed in the summer of 2008 and 2010 in the project location (2 individuals). Observations were associated with habitat along Guida's Sideroad, west of Sideroad 20 in open cedar/mixed forest habitat and in association with FB 2. Another species of conservation, common nighthawk (2 individuals) were observed in 2008 during Breeding Bird Surveys in association FB 2 beaver pond/swamp habitat.	Feeder Line	Within project location
Sites Supporting Area-Sensitive Species: Open Country Breeding Birds - OCBB 3	Large grassland areas are required to be buffered from disturbance and increase the distance between nesting habitats and woody edges as well as nesting potential. Some species require 10 – 30 ha of grassland habitat including Species	This unit contains 375.6 ha of Open Pasture habitat, which is used seasonally to graze cows (**Figure 3** and **11**).	Breeding bird habitat	Large continuous open country habitat suitable for breeding birds. Area-sensitive open country birds, as defined by Appendix G of the Significant Wildlife Habitat Technical Guide (MNR 2000) observed in this wildlife unit include: bobolink (17), northern harrier (2), savannah sparrow (5) and sandhill crane (1).	Turbine 34, Feeder Line, and Access Road	85 m from Turbine 34

Wildlife Habitat	Attributes*	Composition	Function	Relevant Evaluation Criteria Determining Status	Project Components within 120 m	Nearest Distance to project location
	at Risk. Grasslands with a variety of vegetation structure, density and composition tend to support a greater diversity of nesting bird species.					
Sites Supporting Area-Sensitive Species: Open Country Breeding Birds - OCBB 4	Large grassland areas are required to be buffered from disturbance and increase the distance between nesting habitats and woody edges as well as nesting potential. Some species require 10 – 30 ha of grassland habitat including Species at Risk. Grasslands with a variety of vegetation structure, density and composition tend to support a greater diversity of nesting bird species.	This unit contains 1071.2 ha of Open Pasture habitat, which is used seasonally to graze cows (**Figure 3** and **11**).	Breeding bird habitat	Large continuous open country habitat suitable for breeding birds. Area-sensitive open country birds, as defined by Appendix G of the Significant Wildlife Habitat Technical Guide (MNR 2000) observed in this wildlife unit include: bobolink (7), eastern meadowlark (5), northern harrier (6), sandhill crane (59), savannah sparrow (102), and sharp-tailed grouse (2). Short-eared Owl, a species of conservation concern, was first observed on McLean's Mountain in the winter of 2010. Additional observations were made in April and May 2011 along McLean's Mountain Road approximately 1 km north of Greenbush Road in association with OCCB 4. Five individuals of common nighthawk, another species of conservation concern, were observed in 2010 during Breeding Bird Surveys in open areas near Turbine 25, Turbine 36. An individual species was observed in May 2011 in the wetland along Guida's Sideroad as well as open habitat along McLean's Mountain Sideroad approximately 1 km north of Greenbush Road in association OCBB 4.	Turbine 5, 6, 9, 10, 13, 15, 19 and 20; Feeder Line and Access Road	Within project location
Cooper's Milkvetch	Found in open woods, frequently on limestone plains. Associated with Alvars, riparian areas, woodlands and woodland edges. This species is indicative of Alvar habitats in southern Ontario.	Multiple units of Common Juniper Shrub Alvar located in project location (see **Figure 3** and **7**).	Habitat for Species of Conservation Concern.	Associated with one vegetation plot completed in Fresh-Moist Spruce-Fir Hardwood Mixed Forest near Turbine 30. This species is known to be rare (S3) in Ontario and only a single occurrence of this species was observed during vegetation surveys. Therefore this occurrence is significant to the continued existence of this species in the local area.	Turbine 30	Species occurrence is 10 m from Turbine 30
Slender Blazing Star	Found on limestone and dolostone pavement, prairies and open woods. Associated with Alvars, prairie/grassland, savannah and woodland habitat.	Multiple units of Common Juniper Shrub Alvar located in project location (see **Figure 3** and **7**). Woodland habitat is found throughout the project location.	Habitat for Species of Conservation Concern.	Observed in Alvar (ALV 4) along the northeast side of Harbourview Road just outside of the road right-of-way. Further investigations will be required in suitable habitat for this species throughout the project location.	Transmission Line	---

Wildlife Habitat	Attributes*	Composition	Function	Relevant Evaluation Criteria Determining Status	Project Components within 120 m	Nearest Distance to project location
Clustered Broomrape	Habitat consists of shallow soil over limestone. Associated with Alvars.	Multiple units of Common Juniper Shrub Alvar located in project location (see **Figure 3** and **7**).	Habitat for Species of Conservation Concern.	Historical records identified through MNR's NHIC Biodiversity Explorer in the areas of the project location, associated with Alvar communities. Although botanical work was completed in the study area, the project location has been adjusted slightly to avoid disturbances to other known wildlife habitats. Therefore, this species should be carried forward as significant until areas of potential disturbance in proximity to alvar habitat are assessed further to confirm this species presence/absence.	---	---
Prairie Dropseed	Habitat consists of moist to dry limestone plains and calcareous shores. Associated with Alvars and prairie/grassland. This species is indicative of Alvar habitats in southern Ontario.	Multiple units of Common Juniper Shrub Alvar located in project location (see **Figure 3** and **7**).	Prairie Dropseed	Historical records identified through MNR's NHIC Biodiversity Explorer in the area of the project location, associated with Alvar communities. Although botanical work was completed in the study area, the project location has been adjusted slightly to avoid disturbances to other known wildlife habitats. Therefore, this species should be carried forward as significant until areas of potential disturbance in proximity to alvar habitat are assessed further to confirm this species presence/absence.	---	---

*Based on Significant Wildlife Habitat Technical Guide, MNR 2000

[1]COSEWIC 2010

[2]Cornell University 2011

[3]Sandilands, Al. 2005

NORTHLAND POWER

McLean's Mountain Wind Farm
Figure 5: Waterfowl Nesting Areas of Significance Requiring an EIS

North Channel
Tributary of North Channel
Tributary of Manitowaning Bay
Tributary of Perch Lake
Tributary of Perch Creek
Tributary of Bass Lake
Perch Lake
Bass Lake
Pike Lake
WNA 1
WNA 4
WNA 5
NORTH CHANNEL DR
HALL ST
LAKE RD
WABOND RD
BOOZENECK RD
HARBOUR VIEW RD
HILL ST
WILLIS RD
WHITES POINT RD
MORPHETS SIDE RD
COLUMBAS MOUNTAIN RD
BAYSHORE RD W
GREEN BUSH RD
PERCH LAKE RD
BURNETS SIDE RD
DEVILS ELBOW RD
ORRS RD
MILL ST
HONORA BAY RD
SIDEROAD 20
TOWNLINE RD
LIMIT ST
WHITE ROCK RD
GREEN BAY RD
PIKE LAKE RD
INDIAN MOUNTAIN RD
OGEMAH MILKAN
GE TE MILKAN
MIKWA MILKAN
BATMANS RD
BIDWELL RD
LIME KILN RD
6
540
T5 T6 T9 T10 T11 T12 T13 T14 T15 T16 T17 T18 T19 T20 T21 T23 T25 T28 T29 T30 T31 T34 T35 T36 T38 T39 T40 T42 T43

Legend

- Local Roads
- Highway
- Watercourse
- 120 m Project Location Setback
- Lots/Concessions
- Water Body
- Unclassified Woodland Community
- Waterfowl Nesting Areas (Including: MAMM1, MAMM3, MASM1, MASM1-1, MASM1-14, ME, SWDM2,SWDM2-1, SWDM2-2, SWDM3, SWDM4-5, SWTM2-5, SWTM3

Project Components

- 24 Wind Turbine Locations
- Five Extra Permitted Sites
- Substation
- Operations Building
- Horizontal Directional Drilling Access/Exit Pit
- Transmission Line
- Access Road
- Feeder Lines
- Construction Staging Area

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NORTHLAND POWER

McLean's Mountain Wind Farm
Figure 6: Raptor Winter Feeding and Roosting Areas of Significance Requiring an EIS

Legend

- Local Roads
- Highway
- Watercourse
- 120 m Project Location Setback
- Lots/Concessions
- Water Body
- Unclassified Woodland Community
- Raptor Winter Feeding and Roosting Area (120m Buffer) (Including: OAGM4)

Project Components

- 24 Wind Turbine Locations
- Five Extra Permitted Sites
- Substation
- Operations Building
- Horizontal Directional Drilling Access/Exit Pit
- Transmission Line
- Access Road
- Feeder Lines
- Construction Staging Area

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NORTHLAND POWER

McLean's Mountain Wind Farm
Figure 7: Rare Vegetation of Significance Requiring an EIS

Legend

- Local Roads
- Highway
- Watercourse
- 120 m Project Location Setback
- Lots/Concessions
- Water Body
- Unclassified Woodland Community
- RBSA1-1: Common Juiper Shrub Alvar

Project Components

- 24 Wind Turbine Locations
- Five Extra Permitted Sites
- Substation
- Operations Building
- Horizontal Directional Drilling Access/Exit Pit
- Transmission Line
- Access Road
- Feeder Lines
- Construction Staging Area

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NORTHLAND POWER

McLean's Mountain Wind Farm
Figure 8: Woodland Amphibian Breeding Habitat of Significance Requiring an EIS

Legend

- Local Roads
- Highway
- Watercourse
- 120 m Project Location Setback
- Lots/Concessions
- Water Body
- Unclassified Woodland Community
- Woodland Amphibian Breeding Habitat (Including: SWDM2, SWDM2-1, SWDM2-2, SWDM3, SWDM4-5, SWMM1-1, SWMM3-2, SWMM4)

Project Components

- 24 Wind Turbine Locations
- Five Extra Permitted Sites
- Substation
- Operations Building
- Horizontal Directional Drilling Access/Exit Pit
- Transmission Line
- Access Road
- Feeder Lines
- Construction Staging Area

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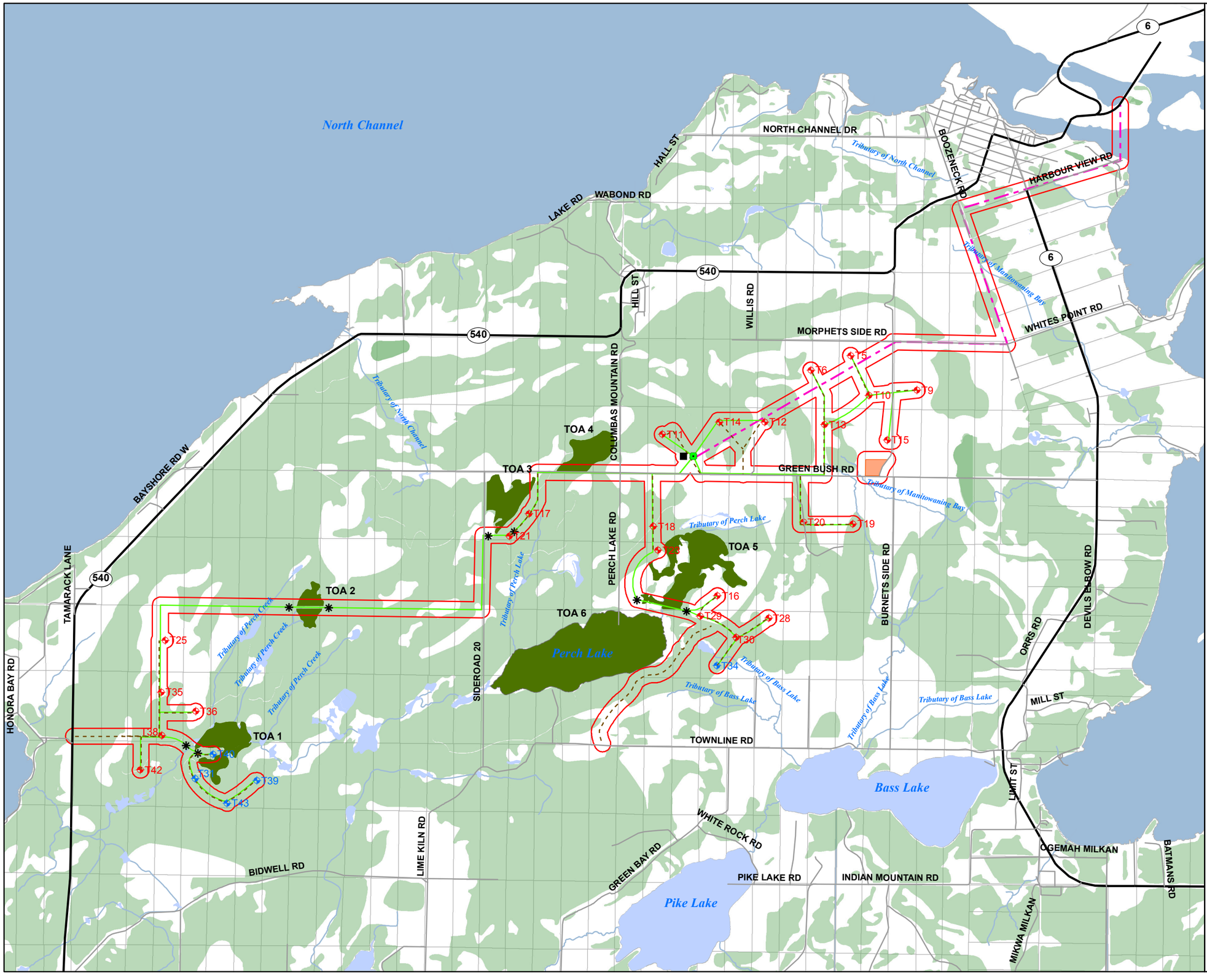

NORTHLAND POWER

McLean's Mountain Wind Farm
Figure 9: Turtle Overwintering Areas of Significance Requiring an EIS

Legend

- Local Roads
- Highway
- Watercourse
- 120 m Project Location Setback
- Lots/Concessions
- Water Body
- Unclassified Woodland Community
- Turtle Overwintering Area & Bullfrog Concentration Areas

Project Components

- 24 Wind Turbine Locations
- Five Extra Permitted Sites
- Substation
- Operations Building
- Horizontal Directional Drilling Access/Exit Pit
- Transmission Line
- Access Road
- Feeder Lines
- Construction Staging Area

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NORTHLAND POWER

McLean's Mountain Wind Farm
Figure 10: Sites Supporting Area-Sensitive Species: Forest Birds Requiring an EIS

Legend

- Local Roads
- Highway
- Watercourse
- 120 m Project Location Setback
- Lots/Concessions
- Water Body
- Unclassified Woodland Community (< 200m from edge)
- Unclassified Woodland Community (Interior > 200 m from edge) (Including: FOD, FODM1, FODM5-1, FODM8-1, FOMM10, FOMM4, FODM5-1, SWCM1-2, SWDM2-1, SWDM2-1, SWDM2-2, SWDM2, SWDM3, SWDM4-5, SWMM1-1, SWMM3-2, SWMM4)

Project Components

- 24 Wind Turbine Locations
- Five Extra Permitted Sites
- Substation
- Operations Building
- Horizontal Directional Drilling Access/Exit Pit
- Transmission Line
- Access Road
- Feeder Lines
- Construction Staging Area

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NORTHLAND POWER

McLean's Mountain Wind Farm
Figure 11: Sites Supporting Area-Sensitive Species: Open Country Breeding Bird Habitat Requiring an EIS

Legend

- Local Roads
- Highway
- Watercourse
- 120 m Project Location Setback
- Lots/Concessions
- Water Body
- Unclassified Woodland Community
- Open Country Breeding Bird Habitat > 30 ha (Including: OAGM4, ME)

Project Components

- 24 Wind Turbine Locations
- Five Extra Permitted Sites
- Substation
- Operations Building
- Horizontal Directional Drilling Access/Exit Pit
- Transmission Line
- Access Road
- Feeder Lines
- Construction Staging Area

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9. Environmental Effects of the Project

A summary of attributes, composition and function defined in **Table 3** and **Table 4** that contribute to wetland and wildlife habitat persistence, may be sensitive to development and/or serve as a good indicators of negative environmental effects are described below in **Table 5**. This summary provides key components of natural feature attributes, composition and function which will be brought forward and evaluated as part of the impact analysis.

The Evaluation of potential impacts, mitigation and residual effects are discussed in **Table 6** and **Section 9.1**. In many cases, activities listed in **Table 2** overlap (e.g. clearing and equipment lay-down). Where activities overlap, the first activity in the project construction sequence or which has the broadest impact is evaluated in **Table 6**.

Table 5: A Summary of Natural Feature Key Features & Function and Other Characteristics that are Sensitive to Development and May Serve as Good Indicators of Negative Environmental Effects.

Natural Feature	Indicator Species Group(s)	Features/Attributes Necessary for Persistence	Features Potentially Sensitive to Development	Good Indicator Features/Species
Wetlands 1-10	Amphibians, Marsh breeding birds	**Physical**: adjacent wetlands, overland flow, localized water retention, water quality, vegetation, vegetation cover **Functional**: connection with other natural features, species diversity, wildlife habitat diversity	Water quality, vegetation along the edge of disturbance, species diversity, wildlife habitat diversity	• Water quality, • Vegetation along the edge of disturbance, • Species diversity (amphibians, marsh breeding birds)
Seasonal Concentration Areas				
Waterfowl Nesting Areas – WNA 1, 4, 5	Various waterfowl species in higher density or abundance	**Physical**: occurrence of various sized swamp and marsh wetland communities with various hydrology, water quality **Functional**: connection between upland and wetland	Habitat quality (displacement or mortality)	• Species abundance and diversity • Presence over multiple years
Raptor Winter Feeding and Roosting Area – RWFR 3, 4	Short-eared Owl or multiple raptor species in higher density	**Physical**: a mix of large open pasture interspersed with forest habitat for cover **Functional**: foraging and cover habitats	Habitat quality (displacement or mortality	• Species abundance and diversity • Presence over multiple years
Rare Vegetation Communities				
Alvar – ALV 1-4	Alvar indicator species in Appendix G of the SWHTG (MNR 2000)	**Physical**: occurrence of large open fields with limited disturbance **Functional**: pollinators, seed dispersal connection to other open areas of similar attributes	Plants species, open field habitat	• Occurrence of Slender Blazing Star (ALV4) • Limited disturbance in open fields

Natural Feature	Indicator Species Group(s)	Features/Attributes Necessary for Persistence	Features Potentially Sensitive to Development	Good Indicator Features/Species
Specialised Habitat for Wildlife				
Woodland Amphibian Breeding Habitat – WABH 1, 2, 5, 6, 7, 8	Green Frog, Spring Peeper, Grey Treefrog, American Toad, Wood Frog and Northern Leopard Frog	**Physical**: occurrence of various sized swamp and marsh wetland communities with various hydrology, water quality **Functional**: connection between upland and wetland	All species observed and water quality,	• Water quality • Amphibian species diversity and abundance • Occurrence of quality vegetation cover
Turtle Over-Wintering Areas – TOA 1-6	Common Snapping Turtle	**Physical**: occurrence of swamp and marsh wetland communities with open deep permanent water **Functional**: connection between winter wetland communities	Connection between wintering sites	• Presence of Snapping Turtle
Sites Supporting Area-sensitive Species: Forest Birds – FB 1, FB 2	Black –throated Green Warbler, Canada Warbler, Ovenbird, Red-shouldered Hawk, Broad-winged Hawk, etc. (**Appendix E, Table E2** – Eval of Sig Report)	**Physical**: occurrence of large contiguous forest patches with low disturbance **Functional**: connection of diverse forest habitats to maintain species diversity	Nesting habitat along edge of forest where disturbance has occurred	Displacement monitoring of interior nesting birds (within 500 m of different infrastructure types)
Sites Supporting Area-sensitive Species: Open Country Breeding Birds - OCBB 3, OCBB4	Vesper Sparrow, Savannah Sparrow, Clay Coloured Sparrow, Upland Sandpiper, etc. (**Appendix E, Table E2** – Eval of Sig Report)	**Physical**: occurrence of large contiguous grassland habitat **Functional**: connection of grassland habitats to maintain species diversity	Nesting habitat within proximity (500 m) of project location infrastructure	Displacement monitoring of open country birds (within 500 m of different infrastructure types)
Habitat of Species of Conservation Concern				
Cooper's	A single individual of Cooper's	**Physical**: occurrence of alvar like	Individual plant	Occurrence of Cooper's

Natural Feature	Indicator Species Group(s)	Features/Attributes Necessary for Persistence	Features Potentially Sensitive to Development	Good Indicator Features/Species
Milkvetch	Milkvetch was observed	conditions (in this case soils) and open canopy **Functional**: pollinators, seed dispersal connection to other open areas of similar attributes		Milkvetch post-construction
Slender Blazing Star	Plant specimen			Plant specimen post-construction if observed during pre-construction surveys
Clustered Broomrape				
Prairie Dropseed				

Table 6: Summary of Potential Negative Effects and Mitigation Measures for Significant/Provincially Significant Natural Features

Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical	Functional					
Wetland 1	Site Preparation - Vegetation Clearing, Grubbing and Grading	Feeder line and access road within 20m T40 – 95m from Wetland 1	▪ Potential for increased erosion and sedimentation on adjacent lands ▪ Removal of woodland vegetation adjacent to wetland	▪ Habitat fragmentation and decreased shade cover in areas adjacent to Wetland 1 ▪ Increased vulnerability of the cleared area to invasion by non-native species ▪ Greater exposure of wildlife to predation through the opening of interior habitat to increased predator activity	Removal of 0.3 ha of upland forest edge habitat adjacent to wetland to accommodate T40. Two horizontal directional drilling access/exit pits (10m x 10m) will need to be cleared 30m from the Perch Creek and associated riparian wetland. 15m wide clearing for a length of 100m (0.15 ha) adjacent to Perch Creek riparian wetlands.	Once to facilitate construction of turbine T40 and associated access road and feeder line	One growing season until vegetation is re-established	▪ Develop and implement an erosion and sediment control plan before removing vegetation ▪ Fencing of boundary between wetland and area to be cleared to prevent encroachment	No Residual Effect
	Construction - Feeder Line Installation	Horizontal Directional Drilling (HDD) Access/Exit Pit – 30m from Wetland 1	▪ Limited potential for increased erosion and sedimentation to enter into Wetland 1, which is 30m away ▪ Removal/storage of spoils from HDD Access/Exit Pit on either side of Perch Creek.	▪ Localized temporary Displacement of wildlife due to noise and vibration	1.5m deep x 1m wide trench in access road leading to HDD Access/Exit Pit HDD will be 160m long at a depth of 2.5m under Perch Creek and have a diameter of 20cm.	Once during construction	1 week during construction only	▪ Ensure all spoils from site are removed in a timely manner. If any storage of spoils is required they should be no closer than 30m from the wetland ▪ Implement erosion and sediment control plan to ensure no transportation of spoils into adjacent areas ▪ Re-grade to preconstruction condition and re-vegetate using native plant species typical of the adjacent habitat	No Residual Effect
	Construction – Access Road	Access Road – 20m from Wetland 1	▪ Loss of native substrate and potential for imported gravel material to enter into immediately adjacent habitat during storm events ▪ Increased runoff during storm events as a result of reduced infiltration in local area	▪ Loss of plant diversity in localized area adjacent to road ▪ Where road substrate is removed post-construction, imported soil has the potential to support the growth of non-native species	11m wide x 100m long to be reduced to 5m wide after construction	During and immediately after construction as well as during storm events	Medium-term - Project Lifespan	▪ Design roads to promote infiltration (e.g. use of gravel materials); ▪ Maintain or provide vegetative buffers; ▪ Stock piled materials necessary for construction will be placed greater than 30m away from a wetland and potential sedimentation arising from these will be contained by the erosion and sediment control measures.	Minimal Residual Effect – road area small, thus marginal decrease in localized infiltration expected; negligible change to surface water runoff volumes expected from pre-development conditions

Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical	Functional					
	Decommissioning – Access Road Removal (if requested by landowner), Rotor, Generator, Tower Disassembly, Foundation Removal	Access Road – 20m from Wetland 1	▪ Disturbance of vegetation that has regenerated adjacent to access road during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	During Decommissioning (6 months)	Short-term	▪ Confine disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop; ▪ Develop and implement an erosion and sediment control plan prior to decommissioning	No Residual Effect
Wetland 2	Construction - Feeder Line Installation	Horizontal Directional Drilling (HDD) Access/Exit Pit – 30m from Wetland 2	▪ Limited potential for increased erosion and sedimentation to enter into Wetland 2, which is 30m away ▪ Removal/storage of spoils from HDD Access/Exit Pit on either side of Wetland 2.	▪ Localized temporary Displacement of wildlife due to noise and vibration	No clearing of vegetation will be required. Effect is limited to 1.5m deep x 1m wide trench in cleared unopened road allowance leading to HDD Access/Exit Pit HDD will be 600m long at a depth of 2.5m under Wetland 2 and have a diameter of 20cm.	Once during construction	1 week during construction only	▪ Ensure all spoils from site are removed in a timely manner. If any storage of spoils is required they should be no closer than 30m from the wetland ▪ Implement erosion and sediment control plan to ensure no transportation of spoils into adjacent areas occur. ▪ Re-grade to preconstruction condition and re-vegetate using native plant species typical of the adjacent habitat	No Residual Effect
Wetland 3	Site Preparation - Vegetation Clearing, Grubbing and Grading	Access Road – 25m Feeder line - 30m HDD Access/Exit Pit – 30m	▪ Potential for increased erosion and sedimentation on adjacent lands ▪ Removal of woodland vegetation adjacent to wetland	▪ Habitat fragmentation and decreased shade cover in areas adjacent wetland ▪ Increased vulnerability of the cleared area to invasion by non-native species	15m wide clearing for a length of 200m (0.3 ha) adjacent to northern portion of Wetland 3, just south of Greenbush Road. Two horizontal directional drilling access/exit pits (10m x 10m) will need to be cleared 30m from southern portion of Wetland.	Once to facilitate construction of access road and feeder line	One growing season until vegetation is re-established	▪ Develop and implement an erosion and sediment control plan before removing vegetation ▪ Fencing of boundary between wetland buffer and area to be cleared to prevent encroachment	No Residual Effect
	Construction – Access Road	Access Road – 25m	▪ Loss of native substrate and potential for imported gravel material to enter into immediately adjacent habitat during storm events ▪ Increased runoff during storm events as a result of reduced infiltration in local area	▪ Loss of plant diversity in localized area adjacent to road ▪ Where road substrate is removed post-construction, imported soil has the potential to support the growth of non-native species	11m wide x 100m long to be reduced to 5m wide after construction	During and immediately after construction as well as during storm events	Medium-term - Project Lifespan	▪ Design roads to promote infiltration (e.g. use of gravel materials); ▪ Maintain or provide vegetative buffers; ▪ Stock piled materials necessary for construction will be placed greater than 30m away from a wetland and potential sedimentation arising from these will be contained by the erosion and sediment control measures.	Minimal Residual Effect – road area small, thus marginal decrease in localized infiltration expected; negligible change to surface water runoff volumes expected from pre-development conditions

Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical	Functional					
	Construction - Feeder Line Installation	Horizontal Directional Drilling (HDD) Access/Exit Pit – 30m from wetland	▪ Limited potential for increased erosion and sedimentation to enter into Wetland, which is 30m away ▪ Removal/storage of spoils from HDD Access/Exit Pit	▪ Localized temporary displacement of wildlife due to noise and vibration	1.5m deep x 1m wide trench in access road leading to HDD Access/Exit Pit HDD will be 160m long at a depth of 2.5m under forested area and a diameter of 20cm, extending from T21 to Sideroad 20	Once during construction	1 week during construction only	▪ Ensure all spoils from site are removed in a timely manner. If any storage of spoils is required they should be no closer than 30m from the wetland ▪ Implement erosion and sediment control plan to ensure no transportation of spoils into adjacent areas occur. ▪ Re-grade to preconstruction condition and re-vegetate using native plant species typical of the adjacent habitat	No Residual Effect
	Decommissioning – Access Road Removal (if requested by landowner)	Access Road – 25m	▪ Disturbance of vegetation that has regenerated adjacent to access road during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	During Decommissioning (6 months)	Short-term	▪ Confine disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop; ▪ Develop and implement an erosion and sediment control plan prior to decommissioning	No Residual Effect
Wetland 4 & 5	Construction - Feeder Line Installation	Trench – 5.25 m from Wetland 4 & 5	▪ Limited potential for increased erosion and sedimentation to enter into Wetland 4 & 5	▪ Localized temporary displacement of wildlife due to noise and vibration	No clearing of vegetation will be required. Effect is limited to a 1.5m deep x 1m wide and 400m long trench in cleared road allowance of Greenbush Road	Once during construction	1 week during construction only	▪ Implement erosion and sediment control plan to ensure no transportation of disturbed road substrate enter into adjacent wetland areas.	No Residual Effect
Wetland 6	Site Preparation - Vegetation Clearing, Grubbing and Grading	Horizontal Directional Drilling (HDD) Access/Exit Pit – 30m either side of wetland	▪ Potential for increased erosion and sedimentation on adjacent lands ▪ Removal of woodland & treed pasture vegetation adjacent to wetland	▪ Habitat fragmentation and decreased shade cover in areas adjacent to wetland ▪ Increased vulnerability of the cleared area to invasion by non-native species	Two horizontal directional drilling access/exit pits (10m x 10m) will need to be cleared 30m from Wetland 6	Once to facilitate HDD under Wetland 6	One growing season until vegetation is re-established	▪ Develop and implement an erosion and sediment control plan before removing vegetation ▪ Fencing of boundary between wetland buffer and area to be cleared to prevent encroachment.	No Residual Effect
	Construction – Access Road	Existing access road approximately 30 east of wetland, vertically separate by an esker ridge	▪ Existing access road to follow an esker and material to be used as construction material, which may result in reduced stability of	▪ Clearing of forest vegetation along slope of road as material is extracted for other construction purposes. ▪ Potential to reduce the	75m length of Wetland 6 finger down slope of access road Road uses an existing quarry road and therefore only clearing of forest slopes is required to facilitate	During and immediately after construction as well as during storm	Two growing seasons until vegetation is well established	▪ Use existing access road (esker) and minimize widening ▪ Minimize vegetation removal on slopes and add additional thick native shrub plantings at the base of slope closest to 75m Wetland 6 finger in proximity to	Minimal Residual Effect – provided: appropriate construction monitoring occurs' erosion and

Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical	Functional					
			landform composed of unconsolidated material ▪ Increased erosion of esker material into down slope natural features	quality of natural features vegetation immediately down slope of access road	extraction of material.	events		access road ▪ Maintain appropriate side slopes and add native plantings to stabilize material during and after removal ▪ Develop and implement an erosion and sediment control plan before removing vegetation on slopes and before any extraction ▪ Stock piled materials necessary for construction will be placed greater than 30m away from a wetland and potential sedimentation arising from these will be contained by the erosion and sediment control measures.	sediment control structure is maintained, additional native plantings added and side slopes are stabilized Effects will be decreased
	Construction - Feeder Line Installation	Horizontal Directional Drilling (HDD) Access/Exit Pit – 30m either side of wetland	▪ Limited potential for increased erosion and sedimentation to enter into Wetland, which is 30m away ▪ Removal/storage of spoils from HDD Access/Exit Pit	▪ Localized temporary Displacement of wildlife due to noise and vibration	HDD will be 800m long at a depth of 2.5m under wetland area and a diameter of 20cm	Once during construction	1 week during construction only	▪ Ensure all spoils from site are removed from the site in a timely manner. If any storage of spoils is required they should be no closer than 30m from the wetland ▪ Implement erosion and sediment control plan to ensure no transportation of spoils into adjacent areas occur. ▪ Re-grade to preconstruction condition and re-vegetate using native plant species typical of the adjacent habitat	No Residual Effect
	Decommissioning – Access Road Removal (if requested by landowner)	Existing access road approximately 30 east of wetland, vertically separate by an esker ridge	▪ Disturbance of vegetation that has regenerated adjacent to access road during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	During Decommissioning (6 months)	Short-term	▪ Confine disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop; ▪ Develop and implement an erosion and sediment control plan prior to decommissioning	No Residual Effect
Wetland 7	Site Preparation - Vegetation Clearing, Grubbing and Grading	T30 – 62m Access Road & Feeder line – 50m	▪ Potential for increased erosion and sedimentation on adjacent lands ▪ Removal of woodland vegetation adjacent to finger of wetland	▪ Habitat fragmentation and decreased shade cover in areas adjacent to Wetland finger ▪ Increased vulnerability of the cleared area to invasion by non-native species	Removal of 0.3 ha of forest edge habitat adjacent to wetland to accommodate T30. 15m wide clearing for a length of 5m (0.08 ha) adjacent to a finger of Wetland 7	Once to facilitate construction of turbine T30 and associated access road and feeder line	One growing season until vegetation is re-established	▪ Develop and implement an erosion and sediment control plan before removing vegetation ▪ Fencing of boundary between wetland buffer and area to be cleared to prevent encroachment	No Residual Effect

Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical	Functional					
	Construction – Access Road Construction	Access Road & Feeder line – 50m	▪ Loss of native substrate and potential for imported gravel material to enter into immediately adjacent habitat as a result of increase in surface water runoff entering adjacent environments	▪ Loss of plant diversity in localized area adjacent to road ▪ Where road substrate is removed post-construction, imported soil has the potential to support the growth of non-native species	11m wide x 100m long to be reduced to 5m wide after construction	During and immediately after construction as well as during storm events	Medium-term - Project Lifespan	▪ Design roads to promote infiltration (e.g. use of gravel materials); ▪ Maintain or provide vegetative buffers; ▪ Stock piled materials necessary for construction will be placed greater than 30m away from a wetland and potential sedimentation arising from these will be contained by the erosion and sediment control measures.	Minimal Residual Effect – road area small, thus marginal decrease in localized infiltration expected; negligible change to surface water runoff volumes expected from pre-development conditions
	Construction - Feeder Line Installation	Trench – 50m from Wetland 7	▪ Limited potential for increased erosion and sedimentation to enter into Wetland 7	▪ Localized temporary Displacement of wildlife due to noise and vibration	1.5m deep x 1m wide trench in access road leading to T30	Once during construction	1 week during construction only	▪ Implement erosion and sediment control plan to ensure no transportation of disturbed road substrate enter into adjacent wetland areas.	No Residual Effect
	Decommissioning – Access Road Removal (if requested by landowner), Rotor, Generator, Tower Disassembly, Foundation Removal	Access Road – 50m from Wetland 7	▪ Disturbance of vegetation that has regenerated adjacent to access road during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	During Decommissioning (6 months)	Short-term	▪ Confine disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop; ▪ Develop and implement an erosion and sediment control plan prior to decommissioning	No Residual Effect
Wetland 8, 9 & 10	Construction – Access Road	Existing access road 2m-5m west of Wetlands 8 & 9 Wetland 10 – 20m	▪ Existing access road to follow an esker and material to be used as construction material, which may result in reduced stability of landform composed of unconsolidated material ▪ Increased erosion of esker material into down slope natural features	▪ Clearing of forest vegetation along slope of road as material is extracted for other construction purposes. ▪ Potential to reduce the quality of natural features vegetation immediately down slope of access road	Entire length of Wetland 8 & 9 down slope of access road Road uses an existing quarry road and therefore only minor upland vegetation removal is required to facilitate widening on west side of road	During and immediately after construction as well as during storm events	Two growing seasons until vegetation is well established	▪ Minimize vegetation removal on slopes of access road ▪ Maintain appropriate side slopes and add native plantings to stabilize material during and after removal ▪ Develop and implement an erosion and sediment control plan before removing vegetation on slopes and before any extraction ▪ Stock piled materials necessary for construction will be placed greater than 30m away from a wetland and potential sedimentation arising from these will be contained by the erosion and sediment control measures.	Minimal Residual Effect – provided: appropriate construction monitoring occurs' erosion and sediment control structure is maintained, additional native plantings added and side slopes are stabilized Effects will be decreased

Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical	Functional					
	Decommissioning – Access Road Removal (if requested by landowner)	Existing access road 2m-5m west of Wetlands 8 & 9 Wetland 10 – 20m	▪ Disturbance of vegetation that has regenerated adjacent to access road during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	During Decommissioning (6 months)	Short-term	▪ Confine disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop; ▪ Develop and implement an erosion and sediment control plan prior to decommissioning	No Residual Effect
Waterfowl Nesting Area 1 (WNA 1)	Site Preparation - Vegetation Clearing, Grubbing and Grading	T40 & HDD Access/Exit Pit – within Access Road & Feeder line associated with turbine – 15m from edge	▪ Removal of a small portion of habitat along the edge of feature ▪ Localized disturbance/displacement/mortality of waterfowl	▪ Greater exposure of wildlife (birds) to predation and parasitism ▪ Reduced recruitment	Removal of 0.15 ha of WNA 1 habitat adjacent to accommodate T40. Two horizontal directional drilling access/exit pits (10m x 10m) will need to be cleared 30m from the Perch Creek riparian area.	Once to facilitate construction of turbine T40 and associated access road and feeder line	Medium-term – Project Lifespan	▪ Additional pre-construction surveys will be conducted to further assess the significance of this feature. If the feature continues to be considered significant, mitigation, as detailed here, is required. Pre-construction surveys to be conducted will be confirmed in consultation with the MNR. ▪ See Section 9.1 for mitigation commitments to compensate for habitat loss and disturbance. ▪ Avoid site preparation and construction during the core waterfowl breeding season (April 15 to June 15)	Minimal Residual Effect
	Construction - Feeder Line Installation	HDD Access/Exit Pit – within	▪ Limited potential for increased erosion and sedimentation to WNA	Localized temporary displacement of wildlife due to noise and vibration	1.5m deep x 1m wide trench in access road leading to HDD Access/Exit Pit HDD will be 160m long at a depth of 2.5m under Perch Creek and have a diameter of 20cm.	Once during construction	1 week during construction only	▪ Implement erosion and sediment control plan to ensure no transportation of spoils into adjacent areas ▪ Re-grade to preconstruction condition and re-vegetate using native plant species typical of the adjacent habitat	No Residual Effect
	Construction – Access Road	Access Road – 15m from WNA 1	▪ Loss of native substrate and potential for imported gravel material to enter into immediately adjacent habitat during storm events ▪ Increased runoff during storm events as a result of reduced infiltration in local area	▪ Loss of plant diversity in localized area adjacent to road ▪ Where road substrate is removed post-construction, imported soil has the potential to support the growth of non-native species	11m wide x 100m long to be reduced to 5m wide after construction	During and immediately after construction as well as during storm events	Medium-term - Project Lifespan	▪ Design roads to promote infiltration (e.g. use of gravel materials); ▪ Maintain or provide vegetative buffers; ▪ Stock piled materials necessary for construction will be placed greater than 30m away from wetland associated with WNA 1 and potential sedimentation arising from these will be contained by the erosion and sediment control measures.	Minimal Residual Effect – road area small, thus marginal decrease in localized infiltration expected; negligible change to surface water runoff volumes expected from pre-

Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical	Functional					
									development
	Operations – Direct Mortality/Displacement of waterfowl	T40 & HDD Access/Exit Pit – partially within T42 - adjacent Access Road – 15m adjacent	▪ Displacement/mortality of birds	▪ Reduced breeding area, abundance and diversity	Low	Sporadic potential	Medium-term - Project Lifespan	▪ 3 year post-construction behavioural and mortality monitoring, consistent with MNR protocols, to assess impacts of turbines on birds for the purpose of advising on mitigation strategies to be used as part of an adaptive management plan	Minimal Residual Effect
	Decommissioning – Access Road Removal (if requested by landowner), Rotor, Generator, Tower Disassembly, Foundation Removal	T40 – partially within Access road adjacent to WNA 4	▪ Disturbance of vegetation that has regenerated adjacent to access road and turbine during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	During Decommissioning (6 months)	Short-term	▪ Disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop; ▪ Develop and implement an erosion and sediment control plan prior to decommissioning ▪ Cease decommissioning in core waterfowl breeding period (April 15 to June 15)	No Residual Effect
Waterfowl Nesting Area 4 (WNA 4)	Site Preparation - Vegetation Clearing, Grubbing and Grading	Access Road, HDD Access/Exit Pit – within T29 – 5m from edge	▪ Removal of a small portion of habitat along the edge of feature ▪ Localized disturbance/displacement/mortality of waterfowl	▪ Greater exposure of wildlife (birds) to predation and parasitism ▪ Reduced recruitment	Two horizontal directional drilling access/exit pits (10m x 10m) will need to be cleared.	Once to facilitate construction of feeder line	One growing season until vegetation is re-established	▪ Additional pre-construction surveys will be conducted to further assess the significance of this feature. If the feature continues to be considered significant, mitigation, as detailed here, is required. Pre-construction surveys to be conducted will be confirmed in consultation with the MNR. ▪ See Section 9.1 for mitigation commitments to compensate for habitat loss and disturbance. ▪ Avoid site preparation and construction during the core waterfowl breeding season (April 15 to June 15)	No Residual Effect
	Construction - Feeder Line Installation	HDD Access/Exit Pit – within	▪ Limited potential for increased erosion and sedimentation to WNA	▪ Localized temporary displacement of wildlife due to noise and vibration	1.5m deep x 1m wide trench in access road leading to HDD Access/Exit Pit	Once during construction	1 week during construction only	▪ Implement erosion and sediment control plan for HDD construction to ensure no transportation of spoils into adjacent areas	No Residual Effect

Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical	Functional					
					HDD will be 800m long at a depth of 2.5m under WNA 4 and have a diameter of 20cm.			▪ Re-grade HDD access area to preconstruction condition and re-vegetate using native plant species typical of the adjacent habitat	
	Construction - Access Road	Existing access road within and adjacent to WNA 4	▪ Existing access road to follow an esker and material to be used as construction material, which may result in reduced stability of landform composed of unconsolidated material ▪ Increased erosion of esker material into down slope natural features	▪ Clearing of forest vegetation along slope of road as material is extracted for other construction purposes. ▪ Potential to reduce the quality of natural features vegetation immediately down slope of access road	Road uses an existing quarry road and therefore only minor upland vegetation removal (100m length) is required to facilitate widening on west side of road	During and immediately after construction as well as during storm events	Two growing seasons until vegetation is well established	▪ Minimize vegetation removal on slopes of access road ▪ Maintain appropriate side slopes and add native plantings to stabilize material during and after removal ▪ Develop and implement an erosion and sediment control plan before removing vegetation on slopes and before any extraction ▪ Stock piled materials necessary for construction will be placed greater than 30m away from the wetland associated with WNA 4 and potential sedimentation arising from the access road will be contained by the erosion and sediment control measures.	Minimal Residual Effect – provided: appropriate construction monitoring occurs' erosion and sediment control structure is maintained, additional native plantings added and side slopes are stabilized effects will be decreased
	Operations – Direct Mortality/Displacement of waterfowl	Existing access road within and adjacent to WNA 4 T29 – 5m from edge	▪ Displacement/mortality of birds	▪ Reduced breeding area, abundance and diversity	Low	Sporadic potential	Medium-term - Project Lifespan	▪ 3 year post-construction behavioural and mortality monitoring, consistent with MNR protocols, to assess impacts of turbines on birds for the purpose of advising on mitigation strategies to be used as part of an adaptive management plan	Minimal Residual Effect
	Decommissioning – Access Road Removal (if requested by landowner), Rotor, Generator, Tower Disassembly, Foundation Removal	Existing access road within and adjacent to WNA 4 T29 – 5m from edge	▪ Disturbance of vegetation that has regenerated adjacent to access road during the operational period	Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	During Decommissioning (6 months)	Short-term	▪ Disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop; ▪ Cease decommissioning in core breeding period (April 15 to June 15)	No Residual Effect
Waterfowl Nesting Area 5 (WNA 5)	Site Preparation - Vegetation Clearing, Grubbing and Grading	T6 – 0 m from edge	▪ Removal of a small portion of habitat along the edge of feature ▪ Localized disturbance/displacement/mortality of waterfowl	▪ Greater exposure of wildlife (birds) to predation and parasitism ▪ Reduced recruitment	0.15 ha area of WNA 5	Once to facilitate construction of T6	Medium-term - Project Lifespan	▪ Additional pre-construction surveys will be conducted to further assess the significance of this feature. If the feature continues to be considered significant, mitigation, as detailed here, is required. Pre-construction surveys to be conducted will be confirmed in consultation with the	No Residual Effect

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			Physical	Functional					
								MNR. ▪ See Section 9.1 for mitigation commitments to compensate for habitat loss and disturbance. ▪ Avoid site preparation and construction during the core waterfowl breeding season (April 15 to June 15)	
	Operations – Direct Mortality/Displacement of waterfowl	T6 – 0 m from edge	▪ Displacement/mortality of birds	▪ Reduced breeding area, abundance and diversity	Low	Sporadic potential	Medium-term - Project Lifespan	▪ 3 year post-construction behavioural and mortality monitoring, consistent with MNR protocols, to assess impacts of turbines on birds for the purpose of advising on mitigation strategies to be used as part of an adaptive management plan	Minimal Residual Effect
	Decommissioning – Rotor, Generator, Tower Disassembly, Foundation Removal	T6 – 0 m from edge	▪ Disturbance of vegetation that has regenerated adjacent to access road during the operational period to access road during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	During Decommissioning (6 months)	Short-term	▪ Disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop; ▪ Cease decommissioning in waterfowl breeding period (April 15 – June 15)	No Residual Effect
Raptor Winter Feeding and Roosting Area 3	Site Preparation - Vegetation Clearing, Grubbing and Grading	T34 – within Access & Feeder line associated with turbine – 0m	▪ Loss of forest vegetation	▪ Disturbance/displacement of wintering raptors, especially Short-eared Owl from local area	Removal of 0.3 ha of Fresh-Moist Deciduous Forest and Fresh-Moist Spruce Fir - Hardwood Mixed Forest edge habitat on the edge of this habitat	Once during construction	Project Lifespan	▪ Project location designed to be on the periphery of this habitat and minimize the loss of vegetation ▪ Additional pre-construction surveys will be conducted to further assess the significance of this feature. If the feature continues to be considered significant, mitigation, as detailed here, is required. Pre-construction surveys to be conducted will be confirmed in consultation with the MNR. ▪ See Section 9.1 for mitigation commitments to compensate for habitat loss and disturbance.	No Residual Effect
	Construction – Access Road Construction	Access Road from Townline Road – within	▪ Access road uses an existing quarry road and only regarding stabilization of side sloped is required	▪ No effect to functional components of this habitat	Limited to an existing quarry road	Once during construction	Project Lifespan	▪ Project location designed to use an existing quarry road to minimize having an effect on this wildlife habitat	No Residual Effect

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			Physical	Functional					
	Operations – Displacement of Winter Raptors	T34 – within	▪ Loss of open pasture habitat	▪ Reduced foraging area for winter raptors	Localized to the immediate vicinity of T30	Winter season	Project Lifespan	▪ 3 year post-construction behavioural and mortality monitoring, consistent with MNR protocols, to assess impacts of turbines on birds for the purpose of advising on mitigation strategies to be used as part of an adaptive management plan	No Residual Effect
Raptor Winter Feeding and Roosting Area 4 **Including Short-eared Owl**	Site Preparation - Vegetation Clearing, Grubbing and Grading Construction – Access Road, Transmission Line & Construction Staging Area	T6, T5, T13, T10, T9, T15, T19, T20 Construction Staging Area, Feeder line and Transmission line - within	Loss of open pasture habitat	▪ Reduced foraging area for winter raptors	RWFR 4 has a total area of 1386.72 ha and project components will remove a total of 7.4 ha of open pasture habitat for the life of the project. A break done of each project components magnitude is listed below ▪ 8 Turbines – 2.4 ha ▪ Access roads & feeder line - 3.5 ha ▪ Transmission line - 1.5 ha ▪ Construction Staging Area - 4 ha	Winter season	Medium-term - Project Lifespan with exception to the Construction Staging area which is temporary during construction (1 yr)	▪ To the degree possible, the project location has been designed to minimize habitat displacement and reduce potential disturbance of winter raptors using this area. ▪ Construction to be done outside of the winter months to avoid disturbance to wintering raptors ▪ Additional pre-construction surveys will be conducted to further assess the significance of this feature. If the feature continues to be considered significant, mitigation, as detailed here, is required. Pre-construction surveys to be conducted will be confirmed in consultation with the MNR. ▪ See Section 9.1 for mitigation commitments to compensate for habitat loss and disturbance.	Minimal Residual Effect
	Operations – Displacement of Birds/Wildlife Operations – Direct Mortality of Birds and Bats	T6, T5, T13, T10, T9, T15, T19, T20 Construction Staging Area, Feeder line and Transmission line - within	▪ Displacement/mortality of birds	▪ Reduced foraging area, abundance and diversity	Mortality - eight turbines and one transmission line Displacement – the above in addition to Construction Staging Area and Access roads	Winter season	Medium-term - Project Lifespan with exception to the Construction Staging area which is temporary during construction (1 yr)	▪ 3 year post-construction behavioural and mortality monitoring, consistent with MNR protocols, to assess impacts of turbines on birds for the purpose of advising on mitigation strategies to be used as part of an adaptive management plan ▪ Potential occurrence of mortality during the winter months will be completed during behavioural monitoring.	Minimal Residual Effect

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			Physical	Functional					
	Decommissioning – Access Road Removal (if requested by landowner), Rotor, Generator, Tower Disassembly, Foundation Removal, Construction Staging Area & Transmission line	T6, T5, T13, T10, T9, T15, T19, T20 Construction Staging Area, Feeder line and Transmission line - within	▪ Disturbance of vegetation that has regenerated adjacent to access road during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	After construction – Construction Staging Area During Decommissioning (6 months)	Short-term	▪ Disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop; ▪ Cease decommissioning in winter feeding or roosting area of Raptor Wintering, Feeding and Roosting habitat (**Figure 6**) if Short-eared Owl is identified utilizing habitat in that particular year.	No Residual Effect
Alvar 1, 2, 3 & 4 **Including Slender Blazing Star Associated with Alvar 4**	Site Preparation - Vegetation Clearing, Grubbing and Grading	Alvar 1 Feeder Line – 15m Alvar 2 Feeder Line – 15m Alvar 3 Feeder Line – 15m; HDD Access/Exit Pit - within Alvar 4 Transmission line – 15m Slender Blazing Star 10m from Harbour View Right-of-Way	▪ The only clearing that will be required within an Alvar community is associated with the HDD Access/Exit Pit of Alvar 3. ▪ Potential for increased erosion and sedimentation within and adjacent to Alvars ▪ Disturbance of adjacent habitat and potential for sedimentation of area where Slender Blazing Star plants occur during extreme storm event	▪ Disruption of indicator species in Alvar 3 ▪ Increased vulnerability of the cleared area to invasion by non-native species within Alvar 3 and adjacent to Alvar 1, 2 & 4 ▪ Reduction in quality of plants and germination of seeds in areas associated with Alvar 4 Slender Blazing Star occurence	One horizontal directional drilling access/exit pits (10m x 10m) will need to be cleared within Alvar 3 1.5m deep x 1m wide trench in existing road right of way for Alvar 1 & 2 8m wide transmission corridor within in existing road right of way for Alvar 4	Once to facilitate construction and during storm events until vegetation establishment	One growing season until vegetation is re-established	▪ Develop and implement an erosion and sediment control plan before removing vegetation ▪ Fencing of boundary between Alvar community and area to be cleared/disturbed to prevent encroachment	No Residual Effect
Woodland Amphibian Breeding Habitat (WABH 1)	Site Preparation - Vegetation Clearing, Grubbing and Grading	Feeder line – 75m	▪ Potential for increased erosion and sedimentation on adjacent lands ▪ Removal of woodland vegetation adjacent to WABH 1	▪ Habitat fragmentation and decreased shade cover in areas adjacent to WABH 1 ▪ Increased vulnerability of the cleared area to invasion by non-native species ▪ Greater exposure to predation ▪ Greater potential for reduced water quality required for successful breeding	One HDD access/exit pits (10m x 10m) will need to be cleared 75m from the Perch Creek and associated riparian wetland.	Once to facilitate construction feeder line	One growing season until vegetation is re-established	▪ Develop and implement an erosion and sediment control plan before removing vegetation ▪ Curtail vegetation removal outside of the core amphibian breeding season (April-June) ▪ Fencing of boundary between WABH 1 and area to be cleared to prevent encroachment	No Residual Effect

Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical	Functional					
	Construction - Feeder Line Installation	Horizontal Directional Drilling (HDD) Access/Exit Pit – 75m from WABH 1	▪ Limited potential for increased erosion and sedimentation to enter into WABH 1 as a result of spoil removal and stockpiling ▪ Removal/storage of spoils from HDD Access/Exit Pit greater than 75m from WABH	▪ Localized temporary Displacement of wildlife due to noise and vibration	1.5m deep x 1m wide trench in access road leading to HDD Access/Exit Pit	Once during construction	1 week during construction only	▪ Ensure all spoils from site are removed from the site in a timely manner. If any storage of spoils is required they should be no closer than 75m from WABH ▪ Implement erosion and sediment control plan to ensure no transportation of spoils into adjacent areas occur. ▪ Re-grade to preconstruction condition and re-vegetate using native plant species typical of the adjacent habitat	No Residual Effect
Woodland Amphibian Breeding Habitat (WABH 2)	Site Preparation - Vegetation Clearing, Grubbing and Grading	T 40 – 95m from WABH 2	▪ Potential for increased erosion and sedimentation on adjacent lands ▪ Removal of woodland vegetation adjacent to WABH 2	▪ Habitat fragmentation and decreased shade cover in areas adjacent to WABH 2 ▪ Increased vulnerability of the cleared area to invasion by non-native species ▪ Greater exposure to predation ▪ Greater potential for reduced water quality required for successful breeding	Removal of 0.3 ha of forest edge habitat adjacent to WABH 2 to accommodate T 40	Once to facilitate construction of turbine T40	One growing season until vegetation is re-established	▪ Develop and implement an erosion and sediment control plan before removing vegetation ▪ Curtail vegetation removal outside of the core amphibian breeding season (April-June) ▪ Fencing of boundary between WABH 2 and area to be cleared to prevent encroachment	No Residual Effect
	Decommissioning – Rotor, Generator, Tower Disassembly, Foundation Removal	Access Road – 20m from Wetland 1	▪ Disturbance of vegetation that has regenerated adjacent to turbine during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	During Decommissioning (6 months)	Short-term	▪ Confine disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop;	No Residual Effect
Woodland Amphibian Breeding Habitat (WABH 3, 4 & 7)	Construction - Feeder Line Installation	Horizontal Directional Drilling (HDD) Access/Exit Pit – 30m from WABH	▪ Limited potential for increased erosion and sedimentation to enter into WABH, which is 30m away ▪ Removal/storage of spoils from HDD Access/Exit Pit on either side of WABH.	▪ Localized temporary Displacement of wildlife due to noise and vibration	No clearing of vegetation will be required. Effect is limited to 1.5m deep x 1m wide trench in cleared un-opened road allowance leading to HDD Access/Exit Pit	Once during construction	1 week during construction only	▪ Ensure all spoils from site are removed from the site in a timely manner. If any storage of spoils is required they should be no closer than 30m to the WABH ▪ Implement erosion and sediment control plan to ensure no transportation of spoils into adjacent areas occur. ▪ Re-grade to preconstruction condition and re-vegetate using native plant species typical of the adjacent habitat	No Residual Effect

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			Physical	Functional					
Woodland Amphibian Breeding Habitat (WABH 5)	Site Preparation - Vegetation Clearing, Grubbing and Grading	Access Road – 90m Feeder line - 90m HDD Access/Exit Pit – 30m	▪ Potential for increased erosion and sedimentation on adjacent lands ▪ Removal of woodland vegetation adjacent to WABH 5	▪ Habitat fragmentation and decreased shade cover in areas adjacent to WABH 1 ▪ Increased vulnerability of the cleared area to invasion by non-native species ▪ Greater exposure to predation ▪ Greater potential for reduced water quality required for successful breeding	15m wide clearing for a length of 200m (0.3 ha) adjacent to northern portion of WABH 5, just south of Greenbush Road. Two horizontal directional drilling access/exit pits (10m x 10m) will need to be cleared 30m from southern portion of Wetland.	Once to facilitate construction of access road and feeder line	One growing season until vegetation is re-established	▪ Develop and implement an erosion and sediment control plan before removing vegetation ▪ Curtail vegetation removal outside of the core amphibian breeding season (April-June) ▪ Fencing of boundary between WABH 5 and area to be cleared to prevent encroachment	No Residual Effect
	Construction – Access Road and Feeder line	Access Road – 90m	▪ Loss of native substrate and potential for imported gravel material to enter into immediately adjacent habitat as a result of increase in surface water runoff entering adjacent environments	▪ Loss of upland forage structure in localized area adjacent to road	11m wide x 100m long to be reduced to 5m wide after construction	During and immediately after construction as well as during storm events	Medium-term - Project Lifespan	▪ Design roads to promote infiltration (e.g. use of gravel materials); ▪ Maintain or provide vegetative buffers;	No Residual Effect
	Decommissioning – Access Road Removal (if requested by landowner)	Access Road – 90m	▪ Disturbance of vegetation that has regenerated adjacent to access road during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	During Decommissioning (6 months)	Short-term	▪ Confine disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop;	No Residual Effect
Woodland Amphibian Breeding Habitat (WABH 6)	Construction - Feeder Line Installation	Feeder line – 10m from WABH 6 along Greenbush Road	▪ Limited potential for increased erosion and sedimentation to enter into WABH	▪ Localized temporary Displacement of wildlife due to noise and vibration	No clearing of vegetation will be required. Effect is limited to a 1.5m deep x 1m wide and 400m long trench in cleared road allowance of Greenbush Road	Once during construction	1 week during construction only	▪ Implement erosion and sediment control plan to ensure no transportation of disturbed road substrate enter into adjacent wetland areas.	No Residual Effect
	Construction – Access Road and Feeder line	Access Road & Feeder line– 75m	▪ Loss of native substrate and potential for imported gravel material to enter into immediately adjacent habitat as a result of increase in surface	▪ Loss of upland forage structure in localized area adjacent to road	11m wide x 100m long to be reduced to 5m wide after construction	During and immediately after construction as well as during storm events	Long-term	▪ Design roads to promote infiltration (e.g. use of gravel materials); ▪ Maintain or provide vegetative buffers	No Residual Effect

Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical	Functional					
			water runoff entering adjacent environments						
	Decommissioning – Access Road Removal (if requested by landowner)	Access Road – 75m	▪ Disturbance of vegetation that has regenerated adjacent to access road during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	During Decommissioning (6 months)	Short-term	▪ Confine disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop;	No Residual Effect
Woodland Amphibian Breeding Habitat (WABH 8)	Site Preparation - Vegetation Clearing, Grubbing and Grading	T23 – 115m from WABH 8	▪ Removal of woodland vegetation adjacent to WABH 8	▪ Habitat fragmentation ▪ Greater exposure to predation	Removal of 0.3 ha of forest habitat 115m away from WABH 8 to accommodate T23	Once to facilitate construction of turbine T23	One growing season until vegetation is re-established	▪ Curtail vegetation removal outside of the core amphibian breeding season (April-June)	No Residual Effect
	Construction - Feeder Line Installation	Feeder line – 115m from WABH 8	▪ Limited potential for increased erosion and sedimentation to enter into WABH habitat	▪ Localized temporary displacement of wildlife due to noise and vibration	Clearing of vegetation is limited to a 1.5m deep x 1m wide trench	Once during construction	1 week during construction only	▪ Implement erosion and sediment control plan to ensure no transportation of disturbed substrate does not enter into WABH	No Residual Effect
Turtle Over-wintering Area (TOA 1,2, 3, 4, 5 & 6)	Site Preparation - Vegetation Clearing, Grubbing and Grading	Feeder line – 7m in additional to further distances T40 – 99m HDD Access/Exit Pit – 30m Access Road – various distances	▪ Potential for increased erosion and sedimentation on adjacent lands	▪ Habitat fragmentation and decreased shade cover in areas adjacent to habitat ▪ Greater exposure of wildlife to predation through the opening of interior habitat to increased predator activity	Removal of small areas of vegetation in areas well outside of turtle over-wintering areas	Once to facilitate construction of turbine T40 and associated access road and feeder line	Medium-term - Project Lifespan	▪ Develop and implement an erosion and sediment control plan before removing vegetation ▪ Erosion and sediment control plan will be designed in a manner that does not prevent turtle access/exit to over-wintering habitat	No Residual Effect
Area Sensitive Species: Forest Birds (FB 2) **Including Canada Warbler, Common Night Hawk**	Site Preparation - Vegetation Clearing, Grubbing and Grading Construction - Collector Line Installation	HDD Access/Exit Pit – within Feeder - within	▪ Displacement and disturbance of area sensitive forest birds	▪ Reduced recruitment	No clearing of vegetation will be required as an existing gap in forest (~10m wide) occurs along an unopened municipal Right-of-Way Effect is limited to 1.5m deep x 1m wide trench for a 400m length in cleared unopened road leading to a 10m x 10m HDD Access/Exit Pit	Once during construction	1 week during construction only	▪ Avoid site preparation and construction during the core breeding bird season (May 1 to July 15)	No Residual Effect

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			Physical	Functional					
Area Sensitive Species: Forest Birds (FB 1) **Including Canada Warbler, Common Night Hawk**	Site Preparation - Vegetation Clearing, Grubbing and Grading	T43 – within T39 - partially in Feeder line & Access Road - within	▪ Removal of a small portion of habitat along the edge of habitat ▪ Localized disturbance/displacement/mortality of areas sensitive birds	▪ Greater exposure of wildlife (birds) to predation and parasitism ▪ Reduced recruitment	Removal of 0.4 ha of forest interior habitat associated with T43 and edge of T39 15m wide clearing for a length of 800m (1.2 ha) within interior forest.	Once during construction	Medium-term - Project Lifespan	▪ Avoid site preparation and construction during the core breeding bird season (May 1 to July 15) ▪ See Section 9.1 for mitigation commitments to compensate for habitat loss and disturbance.	Minimal Residual Effect
	Construction – Access Road & Feeder line	Access Road & Feeder line - within	▪ Displacement and disturbance of area sensitive forest birds	▪ Reduced recruitment	11m wide x 800m long to be reduced to 5m wide after construction 1.5m deep x 1m wide trench in access road	Once during construction	1 week during construction only	▪ Avoid site preparation and construction during the core breeding bird season (May 1 to July 15)	No Residual Effect
	Operations – Direct Mortality/Displacement of Birds and Bats	T43 – within T39 - partially in Feeder line & Access Road - within	▪ Displacement/mortality of birds	▪ Reduced breeding area, abundance and diversity	Low	Sporadic potential	Medium-term - Project Lifespan	▪ 3 year post-construction behavioural and mortality monitoring, consistent with MNR protocols, to assess impacts of turbines on birds for the purpose of advising on mitigation strategies to be used as part of an adaptive management plan	Minimal Residual Effect
	Decommissioning – Access Road Removal (if requested by landowner), Rotor, Generator, Tower Disassembly, Foundation Removal	T43 – within T39 - partially in Feeder line & Access Road - within	▪ Disturbance of vegetation that has regenerated adjacent to access road during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	During Decommissioning (6 months)	Short-term	▪ disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop; ▪ Cease decommissioning in core breeding period (May 1 – July 15)	No Residual Effect
Area Sensitive Species: Open Country Breeding Birds (OCBB 3)	Site Preparation - Vegetation Clearing, Grubbing and Grading	T34 – 100m	▪ Removal of a small portion of habitat along the edge of habitat ▪ Localized disturbance/displacement/mortality of areas sensitive birds	▪ Reduced recruitment	0.04ha of Open Pasture associated with Open Country Breeding Bird Habitat	Once during construction	Medium-term - Project Lifespan	▪ Avoid site preparation and construction during the core breeding bird season (May 1 to July 15) ▪ See Section 9.1 for mitigation commitments to compensate for habitat loss and disturbance.	Minimal Residual Effect
	Operations – Direct Mortality/Displacement of Birds	T34 – 100m	▪ Displacement/mortality of birds	▪ Reduced breeding area, abundance and diversity	Low	Sporadic potential	Medium-term - Project Lifespan	▪ 3 year post-construction behavioural and mortality monitoring, consistent with MNR protocols, to assess impacts of turbines on birds for the purpose of advising on mitigation strategies to be used as part of an adaptive management plan	Minimal Residual Effect

Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical	Functional					
	Decommissioning – Rotor, Generator, Tower Disassembly, Foundation Removal	T34 – 100m	▪ Disturbance of vegetation that has regenerated adjacent to access road during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	During Decommissioning (6 months)	Short-term	▪ disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop; ▪ Cease decommissioning in core breeding period (May 1 – July 15)	No Residual Effect
Area Sensitive Species: Open Country Breeding Birds (OCBB 4) **Including Short-eared Owl, Common Night Hawk**	Site Preparation - Vegetation Clearing, Grubbing and Grading Construction – Access Road, Transmission Line & Construction Staging Area	T6, T5, T13, T10, T9, T15, Construction Staging Area, Feeder line and Transmission line - within	▪ Loss of open pasture habitat associated with open country breeding bird habitat ▪ Localized disturbance/displacement/mortality of areas sensitive birds	▪ Reduced recruitment	OCBB 4 has a total area of 1,701.2 ha and project components will remove a total of 6.8 ha of open pasture habitat for the life of the project. A break done of each project components magnitude is listed below ▪ 6 Turbines – 1.8 ha ▪ Access roads & feeder line - 3.5 ha ▪ Transmission line - 1.5 ha ▪ Construction Staging Area - 4 ha	breeding season	Medium-term - Project Lifespan with exception to the Construction Staging area which is temporary during construction (1 yr)	▪ To the degree possible, the project location has been designed to be widely spaced to reduce potential disturbance of open country breeding birds ▪ Construction to be done outside of the core breeding period (May 1 to July 15) to avoid disturbance to breeding birds ▪ See Section 9.1 for mitigation commitments to compensate for habitat loss and disturbance.	Minimal Residual Effect
	Operations – Direct Mortality/Displacement of Birds	T6, T5, T13, T10, T9, T15, Construction Staging Area, Feeder line and Transmission line - within	▪ Displacement/mortality of birds	▪ Reduced breeding habitat, abundance and diversity	Low	Sporadic potential	Medium-term - Project Lifespan	▪ 3 year post-construction behavioural and mortality monitoring, consistent with MNR protocols, to assess impacts of turbines on birds for the purpose of advising on mitigation strategies to be used as part of an adaptive management plan	Minimal Residual Effect
	Decommissioning – Access Road Removal (if requested by landowner), Rotor, Generator, Tower Disassembly, Foundation Removal, Construction Staging Area & Transmission line	T6, T5, T13, T10, T9, T15, Construction Staging Area, Feeder line and Transmission line - within	▪ Disturbance of vegetation that has regenerated adjacent to access road during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Localized within and immediately adjacent to disturbance	During Decommissioning (6 months)	Short-term	▪ disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop; ▪ Cease decommissioning in core breeding period (May 1 – July 15)	No Residual Effect
Cooper's Milkvetch	Site Preparation - Vegetation Clearing, Grubbing and Grading	Cooper's Milkvetch within the area to be cleared for Turbine 30 (~ 10 m from turbine centre)	▪ Loss of Cooper's Milkvetch	▪ The individual was the only one observed in the study area	Linked to a single plant	During clearing for Turbine 30	Short-term	▪ Transplant Cooper's Milkvetch from area around Turbine 30 and plant other individuals within appropriate habitat ▪ Monitor transplants/plantings to document plant survivorship	No Residual Effect

Significant Natural Feature Affected by Activity	Project Phase & Activity within 120 m of Natural Feature	Distance to Nearest Project Component and Components within 120m	Potential Negative/Positive Effect(s)		Magnitude of Effect	Frequency of Effect	Duration of Effect	Mitigation Measures	Residual Effects
			Physical	Functional					
Clustered Broomrape, Prairie Dropseed, Slender Blazing Star & Cooper's Milkvetch	Site Preparation - Vegetation Clearing, Grubbing and Grading	No known location (other than Cooper's Milkvetch and Slender Blazing Star mentioned above)	▪ Potential loss of other plants of conservation concern	▪ A single individual removed could influence survivorship of species in the larger area	Linked to single specimen(s) if located	During clearing and grubbing	Short-term	▪ As a precaution, assess areas of project location with appropriate habitat for presence of species prior to clearing. This is recommended due to recent changes in project location ▪ Transplant any occurrence observed and plant other individuals within appropriate habitat ▪ Monitor transplants/plantings to document plant survivorship	No Residual Effect

9.1 Mitigation Commitments to Compensate for Habitat Loss and Disturbance

9.1.1 Raptor Winter Roosting and Feeding Area and Sites Supporting Area Sensitive Species: Open-Country Breeding Birds

Develop an agreement with current participating landowners of Lot 7 and 8 of Concession 7, north of the cluster of wind turbines (T5, T6, T9, T10, T13, T15), to manage an area of 15 ha of open country habitat (i.e. Raptor Winter Roosting & Feeding Area and Open-Country Breeding Birds). This area to be managed is equal to or greater than that being removed or displaced by the above turbines, associated access roads and transmission line. The focus of this habitat management program should be to ensure:

1. Active maintenance of open country habitat, consisting of either cattle grazing or bi-annual cutting of herbaceous and woody debris, to prevent succession or change in land-use. This will ensure 15 ha of undisturbed open country habitat on Lot 7 and 8 of Concession 7 remains available for Open-Country Breeding Birds; and

2. Similar habitat maintenance will also provide the necessary habitat for a population of small mammals. These small mammals will support the Raptor Winter Roosting and Feeding Habitat; and

3. Agreement of participating landowners within the management zone (15 ha of Lot 7 and 8 of Concession 7), which prohibits cutting between May 15 to July 15.

9.1.2 Sites Supporting Area Sensitive Species: Forest Birds

Develop an agreement with current participating landowner of Lot 33, Concession 1, to manage a 3 ha area of treed pasture adjacent to turbine 35. This area is equal to or greater than that being removed or displaced as a result of turbine construction, associated access roads and feeder line. The focus of the habitat management program should ensure:

1. Agreement of participating landowner of Lot 33 Concession 1, which overlaps Forest Bird Interior 1 and 2 to not undertake any modification of the forest that would create gaps greater than 20m wide or decrease the canopy cover to less than 75%;

2. Expansion of interior forest habitat through infilling incised areas which currently have a treed pasture community with restoration plantings. This should be completed with

native trees species which complement the adjacent vegetation communities and environmental conditions.

9.1.3 Waterfowl Nesting Habitat

Develop an agreement with current participating landowners to manage availability of nesting habitat within Waterfowl Nesting Areas 1, 4 and 5. This area will be equal to or greater than that being removed or displaced (1.4 ha) as a result of turbine construction and feeder line installation. The focus of the habitat management program should ensure:

1. Strategic placement of waterfowl nest boxes within Waterfowl Nesting Area 1, 4 and 5, greater than 200m from turbine edge.

10. Environmental Effects Monitoring Plan

The environmental effects monitoring plan (EEMP) prepared for the McLean's Mountain Wind Farm project is targeted towards environmental effects that have potential to occur during the construction, operation, and decommissioning phases of the facility. The potential negative environmental effects outlined in **Table 7** are specific to significant or provincially significant natural heritage features and will form part of the overall EEMP for the project in the Design and Operations Report and the Construction Plan Report, as applicable. **Table 7** also summarizes the monitoring plan and monitoring frequency during operation of the facility, as well as contingency measures that will be undertaken if performance objectives are not achieved. **Table 7** should be read in conjunction with **Table 5**, which outlines the features and attributes necessary for persistence, features potentially sensitive to development and are good indicator features or species.

Table 7: Environmental Effects Monitoring Plan

Potential Negative/Positive Effect(s)		Significant Natural Feature Affected by Activity	Performance Objective	Mitigation Measures	Residual Effects	Monitoring Strategy & Methods	Monitoring Locations	Frequency & Duration	Reporting Requirements	Contingency Measures
Physical	Functional									
▪ Potential for increased erosion and sedimentation on adjacent lands ▪ Removal of vegetation adjacent to natural features	▪ Habitat fragmentation and decreased shade cover in areas adjacent to natural feature ▪ Increased vulnerability of the cleared area to invasion by non-native species ▪ Greater exposure of wildlife to predation through the opening of interior habitat to increased predator activity ▪ Greater potential for reduced water quality required for successful breeding	Wetland 1, 3, 6, 7, Woodland Amphibian Breeding Habitat 1, 2, 5, Turtle Over-wintering Habitat 1, 2, 3, 4, 5, 6	Prevent erosion and sedimentation of adjacent lands, minimize removal of vegetation and maintain water quality of natural feature	▪ Develop and implement an erosion and sediment control plan before removing vegetation ▪ Fencing of boundary between wetland and area to be cleared to prevent encroachment ▪ Erosion and sediment control plan and/or fencing will be designed in a manner that does not prevent turtle access/exit to over-wintering habitat	No Residual Effect	Monitor the effectiveness of the erosion and sedimentation control measures	Areas of clearing and grubbing within 30m of a wetland, Woodland Amphibian Breeding Habitat and Turtle Over-wintering Habitat	Biweekly and/or after a 10mm rain event until vegetation is re-established	Notification of incident to the appropriate onsite personnel Identification of results, issue and resolution in annual report, which is to be submitted to the MNR	Soils stabilization treatment and native replacement plantings to be provided in significantly disturbed areas with repeated erosion and sedimentation control measure failures
▪ Limited potential for increased erosion and sedimentation to enter into habitat ▪ Removal/storage of spoils from HDD Access/Exit Pit on either side of Perch Creek.	▪ Localized temporary displacement of wildlife due to noise and vibration	Wetland 1, 2, 3, 4, 5, 6, 7, Waterfowl Nesting Area 1, 4, Raptor Winter Feeding and Roosting Area 3, Woodland Amphibian Breeding Habitat 1, 3, 4, 6, 7, 8	Remove or contain spoils from HDD on site	▪ Ensure all spoils from site are removed in a timely manner. If any storage of spoils is required they should be no closer than 30m from the wetland ▪ Implement erosion and sediment control plan to ensure no transportation of spoils into adjacent areas ▪ Re-grade to preconstruction condition and re-vegetate using native plant species typical of the adjacent habitat	No Residual Effect		In areas where HDD spoils are stored between 120m and 30m from natural features	Biweekly and/or after a 10mm rain event until spoils are removed and vegetation is re-established		Any failure of sediment and erosion control measures meant to contain spoils will result in spoils being truck offsite or at a minimum > 120m away from a natural feature
▪ Loss of native substrate and potential for imported gravel material to enter into immediately adjacent habitat during storm events ▪ Increased runoff during	▪ Loss of plant diversity in localized area adjacent to road ▪ Where road substrate is removed post-construction, imported soil has the potential to	Wetland 1, 3, 7, Waterfowl Nesting Area 1, Woodland Amphibian Breeding Habitat 5, 6	Prevent reduction in quality or lose of plant/vegetation communities adjacent to access roads and turbine	▪ Design roads to promote infiltration (e.g. use of gravel materials); ▪ Maintain or provide vegetative buffers; ▪ Stock piled materials necessary for construction will	Minimal Residual Effect – road area small, thus marginal decrease in localized infiltration	Visual assessment of vegetation communities for disturbance	Areas adjacent to access roads and turbine basis	At the end of construction	Identification of results, issue and resolution in annual report, which is to be submitted to the MNR	Foreign substrate to be removed and native replacement plantings to be provided in significantly disturbed areas

Potential Negative/Positive Effect(s)		Significant Natural Feature Affected by Activity	Performance Objective	Mitigation Measures	Residual Effects	Monitoring Strategy & Methods	Monitoring Locations	Frequency & Duration	Reporting Requirements	Contingency Measures
Physical	Functional									
storm events as a result of reduced infiltration in local area	support the growth of non-native species		basis	be placed greater than 30m away from a wetland and potential sedimentation arising from these will be contained by the erosion and sediment control measures.	expected; negligible change to surface water runoff volumes expected from pre-development conditions					
	▪ Loss of upland forage structure in localized area adjacent to road	Woodland Amphibian Breeding Habitat 5								
▪ Disturbance of vegetation that has regenerated adjacent to access road during the operational period	▪ Increased vulnerability of the site to invasion by non-native species	Wetland 1, 3, 6, 7, 8, 9, 10, Waterfowl Nesting Area 1, 4 & 5, Raptor Winter Feeding and Roosting Area 4, Woodland Amphibian Breeding Habitat 2, 5, 6, Turtle Over-wintering Habitat 1, 3, Area Sensitive Species: Forest Birds FB 1, Area Sensitive Species: Open Country Breeding Birds OCBB 3, 4	Reduce disturbance of vegetation that has regenerated around project components that are to be removed	▪ Confine disturbance to the smallest area possible ▪ No additional footprint disturbance than was created during construction ▪ Re-vegetate disturbed area with fast growing competitive nurse crop; ▪ Develop and implement an erosion and sediment control plan prior to decommissioning ▪ Cease decommissioning in Waterfowl Nesting Area during April 15 to June 15, May 1 to July 15 for other natural features	No Residual Effect	Monitor establishment of nurse crop as well as the effectiveness of the erosion and sediment control plan	A representative subset of project components where habitat is disturbed, including those within 30m of a wetland, Woodland Amphibian Breeding Habitat and Turtle Over-wintering Habitat	Biweekly and/or after a 10mm rain event for one growing season until vegetation is re-established	Notification of incident to the appropriate onsite personnel. Identification of results, issue and resolution in annual report, which is to be submitted to the MNR	Where nurse crop does not sufficiently establish itself and erosion is observed to be occurring, reseed and monitor
▪ Existing access road to follow an esker and material to be used as construction material, which may result in reduced stability of landform composed of unconsolidated material ▪ Increased erosion of esker material into down slope natural features	▪ Clearing of forest vegetation along slope of road as material is extracted for other construction purposes. ▪ Potential to reduce the quality of natural features vegetation immediately down slope of access road	Wetland 6, 8, 9, 10, Waterfowl Nesting Area 4	Prevent the sedimentation of wetland at the base of esker road slope	▪ Use existing access road (esker) and minimize widening ▪ Minimize vegetation removal on slopes and add additional thick native shrub plantings at the base of slope closest to 75m Wetland 6 finger in proximity to access road ▪ Maintain appropriate side slopes and add native plantings to stabilize material during and after removal ▪ Develop and implement an erosion and sediment control plan before removing	Minimal Residual Effect – provided: appropriate construction monitoring occurs' erosion and sediment control structure is maintained, additional native plantings added and side slopes are stabilized effects will be	Monitor the effectiveness of the erosion and sedimentation control measure protecting & visually inspect slope stability and wetland	Areas of wetland 6, 8, 9 and 10 that are closest to the access road	Bi-weekly during construction and monthly after construction for 2 years (except during winter when snow cover is present)	Identification of results, issue and resolution in annual report, which is to be submitted to the MNR	Stabilize slopes ; remove esker material which has reduced quality of wetland and provide native replacement plantings of an appropriate extent and species diversity to ensure no net lose of wetland vegetation and function

Potential Negative/Positive Effect(s)		Significant Natural Feature Affected by Activity	Performance Objective	Mitigation Measures	Residual Effects	Monitoring Strategy & Methods	Monitoring Locations	Frequency & Duration	Reporting Requirements	Contingency Measures
Physical	Functional									
				vegetation on slopes and before any extraction ▪ Stock piled materials necessary for construction will be placed greater than 30m away from a wetland and potential sedimentation arising from these will be contained by the erosion and sediment control measures.	decreased					
▪ Loss of forest vegetation	Disturbance/displacement of wintering raptors, especially Short-eared Owl from local area	Raptor Winter Feeding and Roosting Area 3	Monitor effectiveness of project location design to prevent the displacement of wintering raptors	▪ Project location designed to be on the periphery of this habitat and minimize the loss of vegetation ▪ Additional pre-construction surveys will be conducted to further assess the significance of this feature. If the feature continues to be considered significant, mitigation, as detailed here, is required. Pre-construction surveys to be conducted will be confirmed in consultation with the MNR. ▪ See Section 9.1 for mitigation commitments to compensate for habitat loss and disturbance.	No Residual Effect	Behavioural and mortality post construction monitoring developed in consultation with MNR	Raptor Winter Feeding and Roosting Area 3 & 4, Forest Birds FB 2, Area Sensitive Species: Open Country Breeding Birds OCBB 3, 4	Winter season for 3 years post-construction	Identification of results, issue and resolution in bird and bat post-construction annual report, which is to be submitted to the MNR	Possible change in project operations as determined necessary through consultation with MNR and Northland Power Inc. Possible habitat compensation in other areas of Manitoulin Island, as determined appropriate with MNR and NLP Inc.
Loss of open pasture habitat	Reduced foraging area for winter raptors	Raptor Winter Feeding and Roosting Area 4	Monitor the level of displacement or mortality of birds associated with significant wildlife habitats	▪ To the degree possible, the project location has been designed to minimize habitat displacement and reduce potential disturbance of winter raptors using this area. ▪ Construction to be done outside of the winter months to avoid disturbance to wintering raptors ▪ Additional pre-construction surveys will be conducted to	Minimal Residual Effect					

Potential Negative/Positive Effect(s)		Significant Natural Feature Affected by Activity	Performance Objective	Mitigation Measures	Residual Effects	Monitoring Strategy & Methods	Monitoring Locations	Frequency & Duration	Reporting Requirements	Contingency Measures
Physical	Functional									
				further assess the significance of this feature. If the feature continues to be considered significant, mitigation, as detailed here, is required. Pre-construction surveys to be conducted will be confirmed in consultation with the MNR. ▪ See Section 9.1 for mitigation commitments to compensate for habitat loss and disturbance.						
▪ Displacement/mortality of birds	▪ Reduced foraging/breeding area, abundance and diversity	Waterfowl Nesting Area 1, 4 & 5, Raptor Winter Feeding and Roosting Area 4, Area Sensitive Species: Forest Birds FB 1, Area Sensitive Species: Open Country Breeding Birds OCBB 3, 4		▪ 3 year post-construction behavioural and mortality monitoring, consistent with MNR protocols, to assess impacts of turbines on birds for the purpose of advising on mitigation strategies to be used as part of an adaptive management plan ▪ Potential occurrence of raptor mortality during winter months will be completed during behavioural monitoring.	Minimal Residual Effect					
▪ Potential for increased erosion and sedimentation within and adjacent to Alvars ▪ Disturbance of adjacent habitat and potential for sedimentation of area where Slender Blazing Star plants occur during extreme storm event	▪ Disruption of indicator species in Alvar 3 ▪ Increased vulnerability of the cleared area to invasion by non-native species within Alvar 3 and adjacent to Alvar 1, 2 & 4 ▪ Reduction in quality of plants and germination of seeds in areas associated with Alvar 4 Slender Blazing Star occurrence	Alvar 1, 2, 3 & 4 including Slender Blazing Star Associated with Alvar 4	Prevent sediment and erosion within or immediately adjacent to Alvars and protect indicator species	▪ Develop and implement an erosion and sediment control plan before removing vegetation ▪ Fencing of boundary between Alvar community and area to be cleared/disturbed to prevent encroachment	No Residual Effect	Monitor the effectiveness of the erosion and sedimentation control measures	Areas of clearing and grubbing within 30m of a Alvar	Biweekly and/or after a 10mm rain event until vegetation is re-established	Notification of incident to the appropriate onsite personnel Identification of results, issue and resolution in annual report, which is to be submitted to the MNR	Soils stabilization treatment and native replacement plantings to be provided in significantly disturbed areas with repeated erosion and sedimentation control measure failures

Potential Negative/Positive Effect(s)		Significant Natural Feature Affected by Activity	Performance Objective	Mitigation Measures	Residual Effects	Monitoring Strategy & Methods	Monitoring Locations	Frequency & Duration	Reporting Requirements	Contingency Measures
Physical	**Functional**									
▪ Displacement and disturbance of area sensitive forest birds	▪ Reduced recruitment	Area Sensitive Species: Forest Birds FB 2	Monitor the level of displacement or mortality of birds associated with significant wildlife habitats	▪ Avoid site preparation and construction during the core breeding bird season (May 1 to July 15)	No Residual Effect	Behavioural and mortality post construction monitoring developed in consultation with MNR	Waterfowl Nesting Areas 1, 4 & 5, Forest Birds FB 1, 2, Area Sensitive Species: Open Country Breeding Birds OCBB 3, 4	Breeding season for 3 years post-construction	Identification of results, issue and resolution in bird and bat post-construction annual report, which is to be submitted to the MNR	Possible change in project operations as determined necessary through consultation with MNR and Northland Power Inc. Possible habitat compensation in other areas of Manitoulin Island, as determined appropriate with MNR and NLP Inc.
▪ Removal of a small portion of habitat ▪ Localized disturbance/displacement /mortality of waterfowl/areas sensitive birds	▪ Greater exposure of wildlife (birds) to predation and parasitism ▪ Reduced recruitment	Waterfowl Nesting Area 1, 4 & 5, Area Sensitive Species: Forest Birds FB 1, Area Sensitive Species: Open Country Breeding Birds OCBB 3, Area Sensitive Species: Open Country Breeding Birds OCBB 4		▪ Avoid site preparation and construction during the core breeding bird season (May 1 to July 15), for waterfowl nesting areas dates will be April 15 to June 15 ▪ See Section 9.1 for mitigation commitments to compensate for habitat loss and disturbance.	Minimal Residual Effect					
▪ Loss of Cooper's Milkvetch	▪ The individual was the only one observed in the study area	Species of Conservation Concern – Cooper's Milkvetch	Prevent the disturbance or possible extirpation of Cooper's Milkvetch from the local area	▪ Transplant Cooper's Milkvetch from area around Turbine 30 and plant other individuals within appropriate habitat ▪ Monitor transplants/plantings to document plant survivorship	No Residual Effect	Monitor the survivorship of transplanted and other planted Cooper's Milkvetch	Alvar habitat with low potential for disturbance	Twice yearly for two years after transplant during the growing season.	Identification of results, issue and resolution in annual report, which is to be submitted to the MNR.	Provide additional plantings and locations if survivorship is found to be low
▪ Potential loss of plants of conservation concern	▪ A single individual removed could influence survivorship of species in the larger area	Plant Species of Conservation Concern – Clustered Broomrape, Prairie Dropseed, Slender Blazing Star and Cooper's Milkvetch	Prevent the disturbance or possible extirpation of listed plants from the local area	▪ As a precaution, assess areas of project location with appropriate habitat for presence of species prior to clearing. This is recommended due to recent changes in project location ▪ Transplant any occurrence observed and plant other individuals within appropriate habitat ▪ Monitor transplants/plantings to document plant survivorship	No Residual Effect	Were appropriate habitat occurs and prior to clearing, a search for plant species of conservation concern will be completed within the footprint to be cleared	Clustered Broomrape – Alvar; Prairie Dropseed - Alvars and prairie/grassland ; Slender Blazing Star - limestone and dolostone pavement, prairies and open woods; Cooper's Milkvetch - Alvars, riparian, woodlands and woodland edges	Twice yearly for two years after transplant during the growing season.	Identification of results, issue and resolution in annual report, which is to be submitted to the MNR.	Provide additional plantings and locations if survivorship is found to be low

10.1 Negative Environmental Effects, Design and Operations

The REA regulation requires an environmental effects monitoring plan as a part of the Design and Operations Report to demonstrate how negative environmental effects of the project will be mitigated, and set out a program for ongoing monitoring of the effectiveness of the mitigation measures. **Table 7** above provides a description of performance objectives in respect of each negative environmental effect; mitigation measures planned to achieve performance objectives; how the project is to be monitored; and a contingency plan to be implemented should monitoring reveal that mitigation measures have failed. **Table 7** has been prepared for inclusion in the McLean's Mountain Wind Farm project Design and Operations Report. Additional mitigation measures proposed to minimize impacts of the facility and not related to natural features are summarized in the Design and Operations Report.

11. Negative Environmental Effects, Construction

The REA regulation requires that a Construction Plan Report be prepared to demonstrate how negative environmental effects of construction activities will be mitigated including modifications to construction activities, use of treatment technologies (e.g. Erosion and Sediment Control structures), and scheduling of activities. **Table 7** above provides a description of performance objectives in respect of each negative environmental effect; mitigation measures planned to achieve performance objectives; how the project is to be monitored; and a contingency plan to be implemented should monitoring reveal that mitigation measures have failed. **Table 7** has been prepared for inclusion in the McLean's Mountain Wind Farm project Construction Plan Report. Additional mitigation measures proposed to minimize impacts of the facility and not related to natural features are summarized in the Construction Plan Report.

12. Conclusions

Through a records review, site investigation and natural features evaluation of significance, it was determined that significant and/or provincially significant natural features exist within the project location or prescribed setback areas (**Figure 4 - 11**). As such, an EIS Report is required under Section 38 of Ontario Regulation 359/09. This fourth and final report is prepared to satisfy the requirements under Ontario Regulation 359/09 with respect to a natural heritage assessment.

This EIS Report demonstrates how negative environmental effects of the project will be mitigated, and sets out a program for ongoing monitoring of the effectiveness of the mitigation measures. **Table 7** above provides a description of performance objectives in respect of each negative environmental effect; mitigation measures planned to achieve performance objectives; how the project is to be monitored; and a contingency plan to be implemented should monitoring reveal that mitigation measures have failed. The EIS Report was completed to mitigate any potential negative environmental effects to the following significant or provincially significant natural features:

- Wetland 1 to 10;
- Waterfowl Nesting 1, 4 and 5;
- Raptor Winter Feeding and Roosting 3 & 4;
- Alvar 1 to 4;
- Woodland Amphibian Breeding Habitat 1 to 8;
- Turtle Over-wintering Area 1 to 6;
- Sites Supporting Area-sensitive Species: Forest Birds 1 & 2;
- Sites Supporting Area-sensitive Species: Open Country Breeding Birds 3 & 4;
- Species of Conservation Concern – Cooper's Milkvetch, Slender Blazing Star, Clustered Broomrape, Prairie Dropseed, Short-eared Owl, Canada Warbler, Common Nighthawk & Snapping Turtle

Table 7 outlines how the activities related to the construction, operation and decommissioning of the facility affect these natural features and the appropriate mitigation and monitoring work to be implemented.

13. References

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