



Stantec

**WHITE PINES WIND PROJECT
CONSTRUCTION PLAN REPORT**

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Prepared for:

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1.0 Introduction

1.1 PROJECT OVERVIEW

wpd Canada Corporation (wpd) is a renewable energy development company based in Mississauga, Ontario and is dedicated to providing renewable energy for Ontario. Further information can be found on the company website at <http://www.canada.wpd.de>. wpd is proposing to develop, construct and operate the White Pines Wind Project (the Project) in Prince Edward County, Ontario, in response to the Government of Ontario's initiative to promote the development of renewable electricity in the province (**Figure 1, Appendix A**). The Project was awarded an Ontario Feed-In-Tariff (FIT) contract with the Ontario Power Authority (OPA) in May, 2010 (FIT Contract No. F-000675-WIN-130-601).

The wind turbine Study Area is generally bounded by i) Brummell Road/Bond Road to the North; ii) Lighthall Road to the West; iii) Gravelly Bay Road to the East; and iv) Lake Ontario to the South(**Figure 2, Appendix A**). The proposed Project Location includes all parts of the land in, on or over which the Project is proposed.

The basic components of the Project include 29 REpower MM92-2.05 MW wind turbine generators with a total maximum installed nameplate capacity of 59.45 MW (FIT Contract maximum of 60 MW), step-up transformers located adjacent to each turbine, an electrical power line system, two transformer substations (substation), turbine access roads, and a fenced storage area. Temporary components during construction include work and storage areas at the turbine locations and along access roads and laydown areas (**Figure 2, Appendix A**). The collector system will transport the electricity generated from each turbine to a substation located near Turbine 7 (T07) off Royal Road east of Dainard Road.

An interconnection line will connect the substation near T07 to a substation to be built near the Picton Transformer Station (TS) on County Road 5. While the potential interconnection line's location is depicted on the maps in Appendix A, the actual location of the line is still under negotiation between wpd and Hydro One Networks, Inc. (HONI). If HONI is responsible for construction and operation of the interconnection line to the County Road 5 substation, assessment of potential effects of the line will be outside the REA process, and will be covered under HONI's own Class Environmental Assessment for Minor Transmission Facilities. It is known at this time that wpd will be responsible for construction and operation of portions of the interconnection line along May Road and Fry Road; those portions of the line will therefore be assessed as part of the current REA process.

wpd has retained Stantec Consulting Ltd. (Stantec) to prepare a Renewable Energy Approval (REA) Application, as required under Ontario Regulation 359/09 - Renewable Energy Approvals under Part V.0.1 of the Act of the *Environmental Protection Act* (O. Reg. 359/09). According to subsection 6(3) of O.Reg.359/09, the Project is classified as a Class 4 Wind Facility and will follow the requirements identified in O.Reg.359/09 for such a facility.

1.2 REPORT REQUIREMENTS

The purpose of the Construction Plan Report is to provide the public, Aboriginal communities, municipalities, and regulatory agencies with an understanding of the construction activities associated with the Project, including any environmental effects that may result from engaging in the Project.

The Construction Plan Report has been prepared in accordance with Item 1, Table 1 of O.Reg.359/09 and the Ministry of the Environment's (MOE's) *Technical Guide to Renewable Energy Approvals* (2012).

O.Reg.359/09 sets out specific content requirements for the Construction Plan Report as provided in the following table (**Table 1.1**).

Table 1.1: Construction Plan Report Requirements: O.Reg. 359/09

Requirements	Completed	Section Reference
Set out a description of the following in respect of the renewable energy Project:		
1. Details of any construction or installation activities.	✓	2.0
2. The location and timing of any construction or installation activities for the duration of the construction or installation.	✓	2.0 and Appendix A
3. Any negative environmental effects that may result from construction or installation activities within a 300 m radius of the activities.	✓	3.0
4. Mitigation measures in respect of any negative environmental effects mentioned in paragraph 3.	✓	3.0

2.0 Construction and Installation Activities

This section describes the construction and installation activities required for the Project.

2.1 PRE-CONSTRUCTION ACTIVITIES

Prior to construction, a registered Ontario Land Surveyor (or equivalent) will survey and stake all access roads, collector lines, substations and turbine locations as appropriate. The Project Location (or construction area) includes the footprint of the facility components, plus any temporary work and storage locations. All construction and installation activities will be conducted within this designated area; this includes construction vehicles and personnel. Similarly, all installation activities related to collector lines within the municipal road allowance will be contained within the boundaries of the road allowance.

The Project Location generally consists of the following:

Long-term Land Use Components (for duration of operation; i.e. 20 years)

- 29 REpower MM92-2.05 MW wind turbine generators (18 meter(m) diameter foundation base).
- Crane pads: 30 m x 45 m.
- Underground collector system: corridor between the turbines, including a 0.5 m wide trench per collector line. Fibre optic cables will also be placed in the same trench.
- Above or underground roadside collector lines, to be placed in the municipal road allowance.
- Portions of the interconnection line along May and Fry Road.
- Two substations: approximately 70 m x 70 m.
- Approximately 16.7 kilometers (km) of turbine access roads (5 m in width).
- Storage area: 50 m x 60 m.

Temporary Land Use Components (required only for construction of the Project, i.e. less than one year duration)

- Construction area at each turbine (50 m x 100 m): includes a turbine staging area for construction of the turbine foundation and assembly of the turbine base and rotor (nacelle and blades), and a 30 m x 45 m crane pad to support the crane used for turbine construction.
- Crane laydown area: 6m x 120 m.

- Staging areas for access roads: 15 m wide corridor to each turbine location (15.5 m at a turning radii), includes long term access road (5 m) and temporary staging (10 m) areas, and 30 m wide access road entrances off municipal roads.
- Staging areas for collector lines and the May and Fry Road portions of the interconnection line (15 m- reduced to 5m for operation). In the municipal road allowance, staging areas encompass portions of the road bed and shoulder.

Wherever possible, the construction area has been reduced on a site-specific basis to avoid natural features and water bodies (**Figure 2, Appendix A**).

Preliminary geotechnical work was completed to obtain site-specific conditions within the Study Area. This information was used to aid in evaluating estimates with regards to foundation design and construction for wind turbines. Detailed geotechnical work has been completed at each turbine site, to assist in designing an appropriate style of foundation for each turbine.

2.2 PROJECT COMPONENT INSTALLATION

2.2.1 Wind Turbine Generators

A 50m x 100m construction area will be used around the base of each turbine. Within the construction area will be a turbine staging area for construction of the turbine foundation and assembly of the turbine, parking, foundation spoil storage (excavated soil from foundation area), and a crane pad where the crane will rest during turbine installation.

Turbine Foundations

Turbine components will be delivered directly to the staging areas for temporary storage until assembled. Staging areas will not be excavated or gravelled, and will be restored to pre-existing conditions at the end of construction. Turbine staging areas will be used to varying degrees throughout the construction phase.

Each turbine will have a poured-in-place reinforced concrete foundation. The foundation will likely be an inverted "T" configuration with a diameter of approximately 18 m. An area approximately 23 m x 23 m will be excavated, and the foundation is anticipated to be 3 m deep. The foundation is then backfilled and compacted. Inspections will be required by qualified geotechnical engineering personnel during excavations to confirm that conditions are consistent with the requirements of the *Occupational Health and Safety Act*.

An excavator and truck will be used to excavate the foundation, and no blasting is anticipated. Surface material will be stripped and stockpiled (topsoil separate from subsoil). Ready mix trucks are used to transport the concrete from a commercial facility to the sites. Each excavation will take approximately two to three days, and foundation construction (formwork, rebar placement and concrete pour) is expected to be completed within 2 weeks; if a pile foundation is needed then additional time will be required. The foundation will then need to cure for approximately 28 days prior to erection of the turbine. The foundation itself will then be

backfilled and compacted with stockpiled subsoil and/or clean fill. Construction vehicles will stay on-site during foundation construction. If bedrock is encountered close to the surface it will be removed by mechanical digger to the necessary depth required for the foundation.

The concrete required for the foundation construction will be provided via a commercial facility located in close proximity to the Project. The contractor will be responsible for ensuring that wash water from the cleaning of concrete truck drums is disposed of in a sewage works designed for that purpose and approved under Section 53.(1) of the *Ontario Water Resources Act*, or under Part 8 of the *Building Code Act*.

Turbine Assembly

The Project will include 29 REpower MM92 2.05 MW wind turbines, each consisting of a 100 m steel tube tower (5 sections), three 45.2 m blades (92.5 m rotor diameter), a nacelle, rotor hub and step-up transformer. The turbine tower base is approximately 4 m in diameter and will be anchored to the concrete foundation using large diameter anchor bolts. Turbine specifications are provided in the [Wind Turbine Specifications Report](#).

The turbine towers will be assembled using a heavy-lift crawler crane. The nacelle arrives on-site pre-assembled and is lifted into place by the heavy-lift crane. The rotor is assembled on-site, and consists of the hub and three blades. The blades can either be lifted individually and fastened to the hub or assembled on the ground and mounted as a unit. The assembly and erection of the turbine takes 3 to 5 days depending on wind conditions (cranes cannot operate in wind speeds greater than 8-9 m/s).

A step-up transformer at the base of each turbine converts the power generated by the nacelle to a voltage compatible with the collector line system. Underground collector lines connect directly to the step-up transformer.

Crane Pads

Crane pads will be constructed at the same time as the access roads and will be within the construction area at each turbine site. The crane pad area will be approximately 30 m x 45 m. Generally, the process for crane pad construction will be the same as that for access roads; surface material will be stripped and stockpiled (topsoil separate from subsoil) and a gravel or stone base applied. The excavated soil will be re-used on site as feasible. Once the turbine erection is complete, the gravel area around each turbine and the crane pads will be kept, while the remaining construction area will be rehabilitated to pre-existing conditions. Perimeter surface hydrology will be maintained during crane pad construction.

2.2.2 Electrical Infrastructure

Electrical Collector Lines and Fibre Optic Cable

From each step-up transformer, 34.5 kV underground and/or overhead collector lines carry the electricity generated by the turbines to a substation located on private property, along the

access road to the turbine designated T07. Where feasible, underground collector lines and fibre optic cables have been incorporated into access roads. Where collector lines will be underground, a trench is ploughed and reel trucks dispense the cable at a depth of approximately 1.0 m. The cables will be bedded in sand and the trench will be backfilled with the excavated material. Where directional drilling will be required to install the cable, it will be enclosed in plastic conduits. No blasting is anticipated for the installation of underground collector lines. If bedrock is encountered close to the surface it will be removed by mechanical digger to the necessary depth.

For overhead collector line sections installed in the municipal road allowance that require new poles, equipment used may include a tandem truck pole carrier equipped with an integral crane, a truck or track mounted pole auger, and a backhoe or track mounted excavator. After delivery of the poles, post insulators will be installed and poles will be set into holes augured to a depth of approximately two to three metres. The poles will be plumbed, backfilled, and stabilized with guy wires as appropriate. The power lines will then be strung using reel trailers and tensioning machines. Some sections of the municipal road allowance contain existing distribution lines. In these areas, the existing poles will be upgraded using methods described above. Details of the upgrade, if applicable, will be covered under a joint use agreement with HONI.

May and Fry Interconnection Line

From the substation located near T07, an interconnection line will carry the 34.5 kV electricity to a substation to be built near the Picton TS. Construction methods for the May Rd. and Fry Rd. portions of the interconnection line, which fall under the responsibility of wpd, will follow those listed above for the electrical collector lines.

Substations

The substation yards will be approximately 70 m by 70 m. Construction of the substations will include excavation of the area to allow construction of concrete foundations and installation of gravel. An electrical grounding grid, to which the transformer and all other electrical equipment and structures are grounded, will be installed throughout the yards and covered by gravel fill. The main transformer and other substation structures will be installed on the foundations and electrically connected to the incoming and outgoing power lines. A chain link fence will enclose the yards and will be equipped with a locked vehicle gate to allow for maintenance access. An oil containment structure will be constructed for the transformer, acting as a double containment system for the oil to be used in the transformer.

2.2.3 Access Roads

Approximately 16.7 km of new access roads will be constructed to support construction and transportation vehicles. The gravel access roads will be used periodically during operation for ongoing turbine maintenance. The access roads will be approximately 5 m wide (5.5 m at a turning radius) with a 10 m wide staging area (15 m total), and include 30 m wide access road entrances off municipal roads (with a 15 m wide staging area). Staging areas will be temporary

and will be restored to pre-existing conditions at the end of the construction phase as described in **Section 2.3**.

All access roads have been planned in consultation with the landowner to parallel property boundaries to reduce potential impacts to farm operations and agricultural lands wherever possible. The excavation for the roadbed is expected to be above the water table at all times of the year. No blasting is anticipated for the access roads. If bedrock is encountered close to the surface it will be removed by mechanical digger to the necessary depth required for the roadbed.

To construct the access roads, surface material (i.e. topsoil and subsoil) will be stripped and stockpiled (topsoil separate from subsoil). This stockpiled material will be reused, to the extent possible, during the remediation of the delivery truck turnarounds areas and staging areas. Prior to the placement of aggregate, a geotextile material will be laid down on top of a 0.05 m compacted bed of sand to assist in keeping the aggregate separate from the sand layer. A gravel or stone base will then be installed to facilitate the movement of heavy construction equipment. The road base may be rolled to provide an even driving surface, and will be topped with approximately 0.2 m of crushed gravel consisting of 50 millimetres (mm) of granular A gravel and 300 mm of granular B gravel. Final amounts of all aggregate materials will be decided upon completion of contracts with the turbine supplier and local aggregate suppliers.

The access roads and associated underground electrical collector lines and fibre optic cables will require permanent culvert installations for both watercourse crossings (see **Figure 4, Appendix A**) and for equalization of surface water flow. Culverts will be placed on geotextile material and will be countersunk a minimum of 10% of culvert diameter; they will then be backfilled with a minimum of 300 mm of Granular A and compacted Granular B. Culvert diameter will be determined by the Construction Contractor. All installation activities will conform to Ontario Provincial Standard Specification 421 (OPSS) – Construction Specification for Pipe Culvert Installation in Open Cut. All crossings will require permit approval from Quinte Conservation.

The access road construction for each turbine takes about one to two weeks depending upon location and uses one to two backhoes, several dump trucks and compaction equipment. Construction vehicles (backhoes and excavators) will stay on-site during road construction.

2.2.4 Storage Area

A storage area will be constructed near T06 to contain a variety of materials required throughout the construction and operation of the Project. A gravel or stone base will be applied to the storage area, and a chain link fence will enclose the storage area, equipped with a locked vehicle gate to allow for maintenance access.

2.3 TEMPORARY USES OF LAND

Lands to be temporarily used during the construction are staging areas at each turbine location, (including construction areas and crane laydown areas), temporary areas for access road and collector line construction (including staging areas), delivery truck turnaround areas, access road entrances, and staging areas for collector lines. Any temporary structures used during construction will not be serviced, and will be placed within the delineated construction work areas.

Following construction activities, all temporary work locations will be restored to pre-existing conditions. Restoration work will start following installation of each wind turbine and removal of all construction materials and equipment from each turbine site. This includes removal of the granular and geotextile material from applicable areas. Restoration activities will follow the Site Restoration Plan outlined in the [Decommissioning Plan Report](#).

2.3.1 Turbine Locations

Construction Areas

A construction area will be used around the turbine base, within which will be a turbine staging area and the permanent crane pad. The turbine staging area will be used for temporary storage of turbine components, parking and foundation spoil (excavated soil from foundation area) pile. Turbine components will be delivered directly to the staging areas for temporary storage until assembled. Staging areas will not be excavated or gravelled, and will be restored to pre-existing conditions at the end of the construction phase. Staging areas will be actively used throughout the construction phase, to varying degrees during all construction activities at the siting areas.

Crane Laydown Areas

A heavy-lift crawler crane will be used to assemble the turbines. Crane laydown areas are temporary platforms for the helper cranes that parallel access roads, and will be put in place at the same time as the access roads. Crane paths for movement of the crane between turbine sites will be located along access roads and municipal roads where possible, and the crane will be in some places broken down and transported to other turbine siting areas for re-assembly. Crane laydown areas will be approximately 6 m x 120 m.

Generally, the process for crane laydown area construction will be the same as that for access roads: surface material will be stripped and stockpiled (topsoil separate from subsoil) and a gravel or stone base is applied. The gravel base may be deeper than that of the access roads at an approximate depth of 0.5 m of Granular B type gravel (final amount to be determined following completion of detailed geotechnical studies, and in consultation with the turbine supplier). The excavated soil will be re-used on site as feasible. Metal plates will be laid on the ground prior to crane assembly, and will be disassembled after assembly of the crane.

Once the turbine erection is complete, the crane laydown areas will be rehabilitated to pre-existing conditions. Perimeter surface hydrology will be maintained during construction, and all proposed crane laydown areas have been located on private lands where landowners have agreements with wpd.

2.3.2 Access Roads

Staging Areas

A 10 m staging area will be required for construction of the 5 m wide access road (15 m total). The timing of the temporary use of land for the access road staging areas will begin with the construction of the access roads and these areas will be rehabilitated at the end of the construction phase. The duration of time that the land will be actively used is expected to be 5-6 months.

Delivery Truck Turnaround Areas

All sites require turnaround areas for delivery trucks. These turnaround areas will be the same width as access roads, with turning radii, and will be constructed in the same manner, including the requirement for staging areas. The timing of the temporary use of land for the delivery truck turnaround areas will begin with the construction of the access roads and these areas will be restored to pre-existing conditions, as possible, at the end of the construction phase.

Access Road Entrances

Access road entrances will require a wider turning radius for construction/delivery vehicles. Entrances will be approximately 30 m wide during the construction phase, and can be reduced to an appropriate width at the end of the construction phase to account for routine maintenance vehicles once commissioned.

2.3.3 Collector Lines and Interconnection Line

Collector lines will be located both within municipal road allowance and on private property, while the May and Fry Road portions of the interconnection line will be entirely within municipal road allowance. When located within municipal road allowance temporary staging areas will be required on portions of the road bed and shoulder.

All dimensions will be discussed with the County during the municipal consultation and permitting process.

2.4 MATERIALS BROUGHT ON-SITE

An estimate of the quantities and types of materials to be transported on-site is described below. All estimates will be confirmed and additional details provided upon hiring of the Construction Contractor. Information on the method of transporting the material is provided in **Section 2.6**. Information on the timeline and operational plan for transporting materials to the site is provided in **Section 2.7**. The site locations where materials will be used are described in

Section 2.2, and the mapping provided in **Appendix A**. Details on temporary storage is provided below and in **Section 2.3**.

In general, the Project’s raw materials consist of standard building materials for construction including concrete, wood, geotextile, aggregate, wiring, cables and metal. Additional materials brought on-site include Project infrastructure described above such as turbines, transformers, surge arresters, and grounding and control system equipment.

Construction vehicles such as excavators, trucks used for the transport of turbine components, and cranes will also be brought on-site during construction and installation activities. To the extent possible these materials will be procured locally when available and in sufficient quality and quantity and at competitive prices. wpd will follow the Ontario Feed-in Tariff Program requirements for minimum Ontario content, which promotes local procurement of materials.

Raw materials will be delivered to the substation properties and turbine siting areas for use based on the delivery and construction schedule. If any materials require storage, they will be stored at staging areas for the duration, dependent on the construction schedule. A detailed delivery and construction schedule will be created during detailed design.

Concrete requirements for turbine foundations are estimated to be 360-450 m² of 35megapascals (MPa) type concrete per turbine foundation. The concrete required for the foundation construction will be provided via a commercial facility that is located in close proximity to the Study Area. Ready mix trucks will be used to transport the concrete to each turbine site; there will be no water required for the mixing of concrete on-site. Steel requirements are estimated to be 43.5 tonnes per turbine foundation.

Subsurface excavations will be required for turbine foundations, access roads, collector lines, fibre optic cable, and substations. Backfill required during construction, with the exception of aggregate, will utilize stockpiled material removed during the installation of below ground components – no additional fill from off-site sources is anticipated. Quantity is dependent on grading of site areas.

Gravel requirements are estimated to be as follows:

Table 2.1: Construction Gravel Requirements

Infrastructure	Gravel requirements
Access roads	16700m ³ of Granular A type 25050m ³ of Granular B type
Delivery truck turnaround areas	1452 m ³ of Granular A type 2178 m ³ of Granular B type
Road entrances	1269 m ³ of Granular A type 1903 m ³ of Granular B type
Turbine crane pads	6525m ³ of Granular A type

Table 2.1: Construction Gravel Requirements

Infrastructure	Gravel requirements
	9788 m ³ of Granular B type
Cranelaydown area	10440 m ³ of Granular B type
Substation locations	4990m ³ of Granular B type

Note: values in the above table assume a depth of 0.05m of Granular A and 0.35m of Granular B. Values will be similar, but have not been finalized at this time. Following detailed geotechnical work, detailed design work on access roads, and discussions with the turbine contractor, updated amounts will be provided to the municipality.

Hazardous materials are limited to fuels and lubricants that will be on-site for use in equipment. These materials will be stored in appropriate storage containers during the construction phase by the Construction Contractor. Type and location of designated storage areas will be confirmed by the Construction Contractor prior to construction. The disposal of waste materials generated at the site or transported from the site is described in **Section 2.8**.

2.5 CONSTRUCTION EQUIPMENT USED

Heavy construction equipment will include the following:

- Heavy Lift Crawler Cranes
- Dump trucks
- Water trucks
- Backhoes
- Excavators
- Loaders
- Rollers
- Bulldozers
- Graders
- Reel Trucks
- Concrete Trucks
- Smaller Cranes

Specifications for equipment, including size and weight, will be confirmed upon hiring of the Construction Contractor. The number of trips required is estimated in **Section 2.6** and will be confirmed upon hiring of the Construction Contractor. Most of the heavy construction equipment will be brought into and out of the turbine siting areas via the access roads. Further information on transportation is provided in **Section 2.6**.

2.6 COMPONENT TRANSPORTATION

2.6.1 Traffic Management Plan

Completion of a traffic management plan at this point is not feasible; however, wpd commits to securing equipment suppliers and working with the County of Prince Edward to ensure that an acceptable Traffic Management Plan is developed prior to entering the formal permit application process with the County. The Construction Contractor will implement the Traffic Management Plan to identify and deal with specific traffic planning issues including the management of traffic and the delivery of materials. The Traffic Management Plan will include details on the size and number of trucks, and the timeline and operational plan for transporting materials to the turbine sites (including the sequence of events, duration of activities, and timing with respect to season). The Traffic Management Plan may also include the use of signage, road closures, speed restrictions, truck lighting, load restrictions, and equipment inspections.

The Traffic Management Plan will be developed during the detailed design phase, once the construction contracts have been awarded. wpd will obtain necessary oversize/overweight permits before transporting heavy and/or large items on County roads. wpd and its contractors will work with the County to reach agreements that will ensure that all necessary road assessment is completed. Appropriate roads agreements will be established between wpd and the County of Prince Edward. wpd will work with the County of Prince Edward in development of the Traffic Management Plan, and will provide the Plan to the municipality once complete.

The potential effects to the provincial and municipal roads from the delivery of Project materials are discussed in **Sections 3.7.1** and **3.6.7**, respectively.

2.6.2 Turbine Delivery

REpower (the turbine manufacturer) will be responsible for the transportation of all wind turbine components to the Project site. REpower will develop a detailed Transportation Plan for delivery of the turbine components to the individual turbine sites. Delivery is anticipated to begin approximately 5-7 months after the start of construction, dependent upon seasonal conditions and road access. Repower will be responsible for securing the necessary transportation and safety permits from the County of Prince Edward and the Ministry of Transportation (MTO). In addition, the MTO will be consulted regarding the timing of the deliveries in terms of considering any planned road works on provincial highways when developing the turbine Transportation Plan.

The turbines will be delivered directly to the turbine sites for assembly. Approximately 10 truckloads of turbine components will be transported to each turbine site. For public safety all nonconventional loads will have front and rear escort or “pilot” vehicles to accompany the truck movement on public roads.

Along the component transportation route, intersections may require road widening to accommodate the turning radius of the trucks carrying the tower, nacelle, and blades and roads may require structural upgrading/widening. Road widths must be a minimum of 6 m, and the clearance required on both sides of the road beyond the minimum 6 m road width is approximately 3 m. Where appropriate, the contractor or firm responsible will pay for any temporary or permanent road widening activities and structural upgrades within the County of Prince Edward for transport of components to the Project Location.

Various options will be considered for the transportation route. Final routes will be established in consultation with the County. wpd commits to restoring roads to their pre-construction conditions to the satisfaction of local authorities, as applicable under agreements with the County.

Any upgrading of roads that may be required in the field such as widening turning radii may include widening and improvement of the granular base to accommodate their intended use and such upgrades are not considered significant. Maintenance and repairs of these roads will be discussed with the County.

REpower and wpd will discuss responsibility for any structural enhancements to roads within the municipality, and once the full road requirements have been finalized, detailed plans including maintenance of the roads will be developed with the County as appropriate. The transport of construction related equipment will likely follow the same route to be used for component transportation to the site.

Although there are formal requirements, the Project may provide notification of non-conventional load movements, including advertising in local newspapers; this notification will be provided in the interest of public safety, minimization disruption, and good community relations.

2.6.3 Delivery of Project Materials

Approximately 40 concrete truck trips are required per turbine foundation, for a total of approximately 1160 concrete truck trips. The crane supplier(s) will be responsible for the transportation of all cranes and related components to the Project Location during construction. The heavy-lift crawler crane will be shipped in individual pieces, requiring individual transport, and then assembled on-site.

An estimated 1305 conventional truck and trailer units will transport civil and electrical materials for the construction of roads, substations, electrical collection system and other supporting infrastructure, and will include such items as cabling, fibre optic cabling, concrete reinforcement steel bar and foundation anchor bolts.

2.7 TIMING AND OPERATIONAL PLANS

Construction activities are anticipated to be ongoing for 6-12 months from the start of construction. The timing of key construction activities are provided in **Table 2.2** below. This timeline will shift based on start of construction date, seasonal and environmental restrictions, and agreements with location authorities and contractors. Timing requirements with respect to natural heritage features (e.g. tree clearing, in-water works, etc.) are provided in **Section 3.0**. Preliminary transportation details are outlined in **Section 2.6**.

Table 2.2: Construction Activities – Projection and Schedule

Start of Construction: 6-12 months after REA approval	
Construction Activity	1 Week
Delineation of temporary work areas	
Completion of necessary site grading	
Access road construction and culvert installation	
Turbine site excavation	
Installation of turbine foundations (including curing)	
Installation of underground collector lines	8 weeks - within marked period
Turbine erection	
Restoration of watercourses and temporary work areas	
Substation Sites	
Installation of substations	10 weeks - within marked period
Wind turbine commissioning	
Test Operation	
Site landscaping	
Additional Activities	
Turbine component transportation to Project Location	10 weeks, distributed over 22 weeks
Installation of collector lines in municipal road allowances	8 weeks - start TBD in consultation with municipal authorities

Note: All dates are approximate, and subject to change as the permitting process continues. Construction activities will take place during regular construction hours. When construction is anticipated to be required outside of these hours, the timing will be discussed in advance with the County.

2.8 MATERIALS GENERATED AT, OR TRANSPORTED FROM, THE PROJECT LOCATION

During construction, waste material will be generated at, and transported from, the Project Location. Waste material produced by the Project is expected to consist of construction material (e.g. excess fill, soil, brush, scrap lumber and metal, banding, plastic wrap removed from palletized goods, equipment packaging, grease and oil, steel, etc.) and a minor amount of domestic waste (i.e. garbage, recycling and organics).

Sanitary waste generated during the construction phase will be collected via portable toilets and wash stations supplied by a licensed third party who will be retained prior to the start of major construction activities. The licensed third party will be responsible for the transportation and disposal of all such waste according to regulatory requirements. The exact type of transportation and number of trips required will be determined and confirmed by the third party prior to construction of the Project.

Domestic waste (i.e. garbage, recycling, and organics) will be generated on-site by construction staff, and disposal will be the responsibility of the Construction Contractor. The exact type of trucks and number of truck trips required to dispose of domestic waste will be determined and confirmed by the Construction Contractor prior to construction.

Hazardous materials to be used during the course of construction are limited to fuels and lubricants that will be on-site for use in equipment. These materials will be stored in appropriate storage containers during construction by the Construction Contractor. Designated storage unit type and area will be confirmed by the Construction Contractor prior to construction. The exact type of trucks and number of truck trips required to dispose of hazardous materials will be determined and confirmed by the Construction Contractor prior to construction of the Project.

The gravel and geotextile material that will be removed from the temporary uses of land (Section 2.3) will require disposal following construction of the Project. Disposal of this material is described in the Decommissioning Plan Report, and may include reuse of the granular material. This will require the use of large dump trucks that are capable of transporting heavy loads of excavated gravel. The exact type of truck and number of truck trips required will be determined and confirmed by the Construction Contractor prior to construction of the Project. The excavated soil removed for installation of infrastructure will be stockpiled and re-used on-site as feasible. If not feasible, the soil will be disposed of at an MOE-approved off-site facility to be determined by the Construction Contractor.

Should contaminated soil be encountered during the course of excavations the contaminated material will be disposed of in accordance with the current appropriate provincial legislation, such as Ontario Regulation 347, the General – Waste Management Regulation.

There will be no on-site disposal of waste during the construction of the Project.

3.0 Potential Effects and Mitigation Measures

3.1 GENERAL METHODOLOGY

O. Reg. 359/09 requires that any adverse environmental effects that may result from construction or installation activities be described within a 300 m radius of those activities (known as the Zone of Investigation). This section describes the potential effects, mitigation measures (if required) and net effects that may result from construction or installation activities within the Zone of Investigation. Mapping provided in **Appendix A** shows the 300 m Zone of Investigation around the Project Location boundary.

Descriptions of the existing natural heritage, water, archaeological and heritage environments in the Project Study Area and/or Project Location can be found within the Natural Heritage Assessment and Environmental Impact Study (NHA/EIS), Water Assessment and Water Body Report (WAWBR), Stage I Archaeological Assessment, Stage II Archaeological Assessment, Protected Properties Report and Heritage Impact Assessment Report. These reports form part of the complete REA application package.

Description of potential effects and mitigation measures for specific features located within the setbacks specified by O.Reg. 359/09 are provided in the NHA/EIS, WAWBR, Protected Properties Report, Stage II Archaeological Assessment and Heritage Impact Assessment Report.

For some natural environment and socio-economic features, mitigation measures are anticipated to eliminate all effects.

The need, assessment, and selection of protection and mitigation measures discussed in the following sections have been predicated on the hierarchical principles of:

- avoidance – the elimination of adverse environmental effects by siting, construction scheduling, and design considerations
- minimization – reduction or control of adverse environmental effects through Project modifications or implementation of protection and mitigation measures
- compensation – enhancement or rehabilitation of affected areas

The application of these principles has greatly reduced the potential for adverse environmental effects from the Project as demonstrated in the following subsections.

Where net effects remain, they are characterized as either positive or adverse. Positive net effects were not assessed. Adverse net effects were assessed utilizing the following nine descriptors, as applicable:

- Direction: the degree to which an effect may be positive or adverse;
- Duration: the period of time until the element returns to baseline conditions;
- Ecological/Social Context: the nature of the area in which the effect may occur;
- Frequency: the number of times that an effect may occur;
- Magnitude: the degree to which an effect may occur;
- Permanence: the degree to which an effect will not return to baseline conditions;
- Probability: the likelihood that an effect may occur;
- Reversibility: the likelihood that an element will recover from an effect; and,
- Spatial Extent: the area within which an effect may occur.

The key performance objective for each of the features discussed below is avoiding and/or minimizing potential effects (through the use of appropriate mitigation measures) throughout the construction phase of the Project. The proposed mitigation measures will assist in achieving this performance objective. Additional information related to specific performance objectives is detailed in the Construction Environmental Effect Monitoring Plan provided in **Section 5.0**.

3.2 CULTURAL HERITAGE AND ARCHAEOLOGICAL RESOURCES

3.2.1 Protected Properties and Cultural Heritage Resources

In accordance with O. Reg. 359/09, a Protected Properties Report and a Heritage Impact Assessment Report were undertaken for the Project. The reports will be submitted to the MOE as part of the complete REA application. See **Figure 3, Appendix A** for the location of built heritage resources.

The Protected Properties and Heritage Impact Assessment Reports determined that:

- Nine protected properties were found within the Study Area. Potential negative impacts were identified for three of the properties: the Dulmage-Farrington-Marshall Driveshed, the Gibbins' Property and the Royal Street Cheese Factory.
- A total of 30 significant built heritage resources and two significant cultural heritage landscapes were identified within the Study Area. Potential negative impacts were identified for 6 of the significant built heritage resources and one of the significant cultural heritage landscapes.

Potential Effects

Potential negative impacts on protected properties and significant built heritage resources are impacts on views, and vibration damage from the installation of below-grade infrastructure.

Mitigation Measures

In regards to the three protected properties it is recommended that:

- In the event that underground collector lines are installed, maximum acceptable peak particle velocity should be determined by a qualified engineer prior to any subgrade activities to ensure the structural integrity of the Dulmage-Farrington-Marshall Driveshed, the residential building on the Gibbins' Property and the Royal Street Cheese Factory;
- Vibration levels should be monitored during any below-grade construction activities in the vicinity of the Dulmage-Farrington-Marshall Driveshed, the Gibbins' Property and the Royal Street Cheese Factory to ensure that acceptable levels are not exceeded;
- Installation of any above ground collector lines should avoid the west side of Brewers Road in the vicinity of the Dulmage-Farrington-Marshall Driveshed; the south side of Royal Road in the vicinity of the Royal Street Cheese Factory and the Gibbins' Property; and the east side of Dainard Road in the vicinity of the Gibbins' Property; and,
- Removal of or damage to trees along Brewers Road should be avoided.

In regards to the 6 significant built heritage resources and the one significant cultural heritage landscape it is recommended that:

- Prior to any below-grade construction within 50 m of: 104 Brewers Road or 940, 1038, 1210, 1247, and 1327 Royal Road (BHRs 2, 6, 7, 8, 9, and 10) a study should be conducted by a qualified engineer to determine the maximum vibration peak particle velocity for each structure;
- Vibrations should be monitored during below grade construction to ensure that acceptable vibration levels are not exceeded;
- In the event that an above ground collector lines are installed, those components should be installed on the side of the road opposite the Built Heritage Resource or Cultural Heritage Landscape in order to best conserve significant views; and,
- The removal of trees along roads in the Study Area should be avoided to the greatest extent practicable.

Net Effects

Application of the recommended mitigation measures will result in no net effects on protected properties and cultural heritage resources during construction of the Project.

3.2.2 Archaeological Resources

In accordance with O. Reg. 359/09, Stage 1 and 2 Archaeological Assessments were completed for the Project and will be submitted to the MOE as part of the complete REA application package.

Based on the results of the Stage 1 assessment, a majority of the Study Area has been identified as having elevated potential for previously undiscovered archaeological resources. Give the elevated archaeological potential for both prehistoric and historic period resources, a Stage 2 Archaeological Assessment was recommended and site visits conducted on all lands with the potential to be directly impacted by the Project. No evidence of archaeological sites was encountered during the Stage 2 archaeological assessment.

Potential Effects

Potential impacts to archaeological resources could occur if encountered during construction.

Mitigation Measures

Should other archaeological or historical materials or features be found during construction, all work within the vicinity of the find will be suspended and a Ministry of Tourism, Culture and Sport (MTCS) archaeologist and appropriate Aboriginal communities will be contacted. In the event that human remains are encountered or suspected of being encountered before or during construction, all work will stop immediately. Notification will then be made to the Ontario Provincial Police who will conduct a site investigation and contact the district coroner. The MTCS, appropriate Aboriginal communities, and the Registrar of Cemeteries, Cemeteries Regulation Unit, Ministry of Small Business and Consumer Services will also be notified.

Net Effects

By following the procedures recommended above no adverse net effects on archaeological resources are anticipated during construction of the Project.

3.3 NATURAL HERITAGE RESOURCES

In accordance with O. Reg. 359/09, an NHA/EIS was undertaken for the Project and will be included as part of the REA application. The following provides a summary of the potential effects and the associated mitigation measures as described in that report. In addition, potential effects and mitigation measures are identified for regulated features outside the setbacks, and unregulated natural features, which are therefore not considered in the NHA/EIS. Natural heritage resources are shown in **Figure 4, Appendix A**.

Under O. Reg. 359/09, Project infrastructure is prohibited within a Provincially Significant Wetland (PSW). Setbacks are provided under the Regulation for other natural features, as summarized in Table 4.1 of the Project Description Report. Development within the setback

distance of these features requires further study under an Environmental Impact Study to determine the magnitude of effects following mitigation.

Both the NHA and EIS have been submitted to the MNR for their confirmation that the methodology, recommendations, and conclusions are to their standards.

3.3.1 Wetlands

The South Bay Coastal Provincially Significant Wetland, and Bloomfield Creek Locally Significant Wetland, are located within 300 m of the Project Location. Field investigations identified an additional 8 unevaluated wetlands and 8 additional wetlands as occurring within 120m of the Project Location.

The 18 wetlands can be seen on **Figure 4, Appendix A**.

Potential Effects

As all components of the Project are sited outside the wetland boundaries, there will be no direct loss of wetland habitat or function as a result of the Project.

Indirect impacts resulting from construction activities, such as dust generation, sedimentation, and erosion, are expected to be short term, temporary in duration and can be mitigated through the use of standard site control measures. During construction, there will be increased traffic and the potential for accidental spills. The magnitude of these impacts is expected to decrease with increasing distance from the wetland feature to the construction activities. New access roads may disrupt the quality of surface water input into wetlands. Vegetation clearing and disruption disturbance in close proximity to wetland features may cause changes in vegetation composition and create opportunities for the introduction and spread of invasive species.

Indirect impacts during construction could also include disturbance or disruption to the wildlife function supported by the feature.

Mitigation Measures

The following mitigation measures will be implemented:

- No development will be permitted within the wetland boundary.
- The boundaries of all wetlands within 30 m of the proposed construction area will be flagged / staked in the field by a qualified ecologist prior to construction to assist with the demarcation of the construction area, to ensure construction activities avoid these sensitive areas and to assist with the proper field installation of erosion and sedimentation controls;
- Where possible, and as appropriate, access roads will be constructed at or near existing grade to maintain surface flow contributions to wetlands.

- Where new access roads cross existing drainage features, design will include culverts or other appropriate structures of sufficient size to accommodate flow.
- Mitigation measures for vegetation removal will be implemented as outlined in Section 6.4.1.1 of the Environmental Impact Study Report.
- Mitigation measures for sediment and erosion control will be implemented as outlined in Section 6.4.1.2 of the Environmental Impact Study Report.
- Mitigation measures for dewatering will be implemented as outlined in Section 6.4.1.3 of the Environmental Impact Study Report.
- All refueling activities will occur well away from wetlands. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately.
- Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.

Mitigation measures to be applied to each wetland feature are provided in Table 6.5, Appendix B of the Environmental Impact Study Report.

Net Effects

It is anticipated that with the implementation of the mitigation measures described above there will be no adverse net effects to wetlands during construction of the Project.

3.3.2 Areas of Natural and Scientific Interest

Within 300m of the Project Location, the following Areas of Natural and Scientific Interest (ANSI) are found (**Figure 4, Appendix A**):

- Milford-Black Creek Valley Provincially Significant Earth Science ANSI - access roads have been sited within the ANSI boundary, and turbines, collector lines and access roads are also found within 50 m of the ANSI boundary.
- Prince Edward to Ostrander Point Candidate Life Science ANSI (non-provincially significant) - Project components have been sited within the boundaries of this candidate Life Science ANSI.
- Black Creek Valley Marshes and Forests Regionally Significant Life Science ANSI (non-provincially significant) – no Project components have been sited within the boundaries of this ANSI.

Potential Effects

Potential impacts to the Earth Science ANSI from construction of the access roads could include erosion or loss of part of the feature. Alteration or destruction of landforms can also occur in association where grading activities are undertaken. Potential impacts to the candidate Life

Science ANSI are related to the natural heritage of the feature as outlined throughout **Section 3.3**. No potential impacts are anticipated to the regionally significant Life Science ANSI.

Mitigation Measures

For the Earth Science ANSI, the following mitigation measures will be implemented:

- Mitigation measures for vegetation removal will be implemented as outlined in Section 6.4.1.1 of the Environmental Impact Study Report;
- Mitigation measures for sediment and erosion control will be implemented as outlined in Section 6.4.1.2 of the Environmental Impact Study Report;
- Mitigation measures for dewatering will be implemented as outlined in Section 6.4.1.3. of the Environmental Impact Study Report; and
- Where possible, and as appropriate, access roads will be constructed at or near existing grade.

For the candidate Life Science ANSI, mitigation measures will follow those outlined in **Section 3.3**.

Net Effects

The Earth Science ANSI has been designated for its geological importance, and not its ecological importance. Works for the Project that are proposed in the ANSI are spatially small and shallow works that would not impact the Earth Science ANSI feature or its function. There would not be a loss of provincially significant earth science values as a result of the Project.

3.3.3 Valleylands

The Black Creek Valleyland is located within 300 m of the Project Location (**Figure 4, Appendix A**). No Project components are located in the Valleyland.

Potential Effects

Potential effects to the valleyland are erosion leading to sedimentation of watercourses found within the valleyland system.

Mitigation Measures

Mitigation measures for sediment and erosion control will be implemented as outlined in Section 6.4.1.2 of the Environmental Impact Study Report.

Net Effects

The application of the above mitigation measures during construction will ensure that effects to surface water due to construction activities are minimized, and that any potential net effects are spatially and temporally limited.

3.3.4 Woodlands

The records review and site investigation confirmed that 18 woodlands occur within 120 m of the Project Location (**Figure 4, Appendix A**). Aerial photography indicates that additional woodlands are located within 300 m of the Project Location.

Potential Effects

Construction activities will result in the removal of woodland habitat.

Alteration or removal of vegetation for construction of Project components could have the potential to affect both flora and fauna through loss of species diversity, by reducing or fragmenting available habitat (especially for species with low mobility), from the introduction or spread of invasive species, and from the temporary disruption to movement of wildlife.

Indirect impacts resulting from construction activities, such as dust generation, sedimentation and erosion, are expected to be short term, temporary in duration and can be mitigated through the use of standard site control measures where land based disturbance is proposed within 120 m of the Feature. During construction there will be increased traffic and the potential for accidental spills. Improper disposal of wastes (fluids, containers, cleaning materials) could also have a negative impact on the feature.

Mitigation Measures

The following mitigation measures will be implemented:

- A Natural Areas Management Strategy will be developed and implemented for the Project as described in Section 6.5 of the Environmental Impact Study Report. The strategy will include:
 - A Replanting and Restoration Plan. All disturbed areas of the construction site will be restored to preconstruction grades as soon as conditions allow.
 - An Invasive Species Management Plan will be created for the Project in consultation with MNR with the goal of managing spread of the invasive species in areas of construction related disturbance.
 - A Vegetation Monitoring Plan will be created for the project to monitor the success of the Replanting Plan and the Invasive Species Management Plan.
- Mitigation measures for vegetation removal will be implemented as outlined in Section 6.4.1.1 of the Environmental Impact Study Report;

- Mitigation measures for sediment and erosion control will be implemented as outlined in Section 6.4.1.2 of the Environmental Impact Study Report;
- Mitigation measures for dewatering will be implemented as outlined in Section 6.4.1.3. of the Environmental Impact Study Report; and
- All refueling activities will occur well away from the woodlands. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately.
- Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.

Mitigation measures by feature are provided in Table 6.6, Appendix B of the Environmental Impact Study Report.

Net Effects

With the implementation of the above mitigation measures, permanent impacts to woodland habitat will be a small percentage of the entire amount present in the Study Area.

3.3.5 Provincial Parks and Conservation Reserves

The Study Area does not contain any provincial parks or conservation reserves. As no provincial parks or conservations reserves are present, no potential effects will occur and no mitigation measures are necessary.

3.3.6 Other Designated Natural Areas

Two other designated natural areas are located within 300 m of the Project Location: Prince Edward County South Shore Important Bird Area (IBA), and the Point Petre Provincial Wildlife Management Area (**Figure 4, Appendix A**). The IBA extends along the shore of Lake Ontario from the tip of the Prince Edward Point peninsula to the Wildlife Management Area.

A variety of Project components are located within the IBA, and no components are located within the Wildlife Management Area.

Potential Effects

Potential impacts to natural heritage and recreational values of the two designated natural areas are outlined in **Sections 3.3.7 and 3.6.6**, respectively.

Mitigation Measures

Mitigation measures related to construction impacts on natural heritage and recreational values of the two designated natural areas are outlined in **Sections 3.3.7 and 3.6.6**, respectively.

Net Effects

A review of net effects on natural heritage and recreational values of the two designated natural areas are outlined in **Sections 3.3.7 and 3.6.6**, respectively.

3.3.7 Significant Wildlife and Wildlife Habitat

Potential Effects

Significant Wildlife

Within the context of O. Reg. 359/09, endangered and threatened species are addressed as part of MNR's *Approval and Permitting Requirements Document for Renewable Energy Projects* (APRD) requirements (September 2009). Information required as part of these requirements has been submitted to MNR. Where this information indicates that approvals or permits are required, these will be addressed separately through the applicable statute and its permitting process. Prior to construction, all applicable permits and approvals would be obtained, and all conditions contained within permits and approvals would be implemented, including those that may occur during operation.

Significant Wildlife Habitat

Significant wildlife habitat within the Study Area includes four generalized significant wildlife habitat areas, two migratory landbird stopover and staging areas, four amphibian breeding areas and seven shrub/successional breeding bird areas (**Figure 4, Appendix A**).

A portion of the Fry Road interconnection line may be located within a generalized significant wildlife habitat area, depending on detailed design of the line. Potential effects of construction are direct vegetation removal and wildlife mortality, and indirect through dust, sedimentation and erosion, accidental spills and traffic.

Project components will be located in the two migratory landbird stopover and staging areas. Potential effects of construction are direct effects such as destruction, fragmentation and disturbance of habitat, and disturbance due to increased traffic, noise or dust.

No Project components will be located in amphibian breeding areas. Potential effects of construction on amphibian breeding areas are direct disturbance and mortality, and indirect through dust, sedimentation and erosion and accidental spills.

Project components will be located in six of the shrub/successional breeding bird areas. Potential effects include destruction, fragmentation and/or disturbance of habitat, direct loss of nests, and disturbance due to increased traffic, noise or dust.

Mitigation Measures

For areas of generalized significant wildlife habitat, migratory landbird stopover and staging areas, and shrub/successional breeding bird areas, the following mitigation measures will be implemented:

- In the vicinity of the generalized significant wildlife habitat, construction machinery should be checked daily for snakes prior to operating.
- A Natural Areas Management Strategy will be developed and implemented for the Project as described in Section 6.5 of the Environmental Impact Study Report. The strategy will include:
 - A Replanting and Restoration Plan. All disturbed areas of the construction site will be restored to preconstruction grades as soon as conditions allow.
 - An Invasive Species Management Plan will be created for the Project in consultation with MNR with the goal of managing spread of the invasive species in areas of construction related disturbance.
 - A Vegetation Monitoring Plan will be created for the project to monitor the success of the Replanting Plan and the Invasive Species Management Plan.
- Mitigation measures for vegetation removal will be implemented as outlined in Section 6.4.1.1 of the Environmental Impact Study Report;
- Mitigation measures for sediment and erosion control will be implemented as outlined in Section 6.4.1.2 of the Environmental Impact Study Report;
- Mitigation measures for dewatering will be implemented as outlined in Section 6.4.1.3. of the Environmental Impact Study Report; and
- All refueling activities will occur well away from the areas. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately.
- Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.

For amphibian breeding areas, the following mitigation measures will be implemented:

- Mitigation measures for sediment and erosion control will be implemented as outlined in Section 6.4.1.2 of the Environmental Impact Study Report; and
- All refueling activities will occur well away from the areas. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately.

Net Effects

With the implementation of the above mitigation measures, construction effects to significant wildlife habitat will be reduced and will be temporary.

3.3.8 Other Wildlife and Wildlife Habitat

Potential Effects

Over the course of the site investigation program 154 bird, nine amphibian, six reptile, two butterfly, three odonata and six mammal species were observed within the Study Area. The majority of wildlife species observed in the Study Area native to Ontario are ranked S5 (secure; common and widespread) or S4 (apparently secure; uncommon but not rare).

Direct loss of species habitat is addressed in **Sections 3.3.1, 3.3.4, 3.3.7, 3.3.9 and 3.3.10**. Construction activities have the potential for accidental mortality to wildlife.

Construction activity, such as increased traffic, dust or noise also has the potential to indirectly disturb wildlife and their habitats. Disturbance may occur as a result of increased on-site human activities.

Mitigation Measures

Accidental mortality of wildlife during construction activities will be reported to wpd and the environmental representative of the Construction Contractor. wpd will review all instances of mortality with the Ministry of Natural Resources to determine where it is feasible for construction details such as employee training, traffic speed and construction location to be adjusted.

Mitigation measures for traffic, dust and noise are outlined in **Sections 3.6.7, 3.5.2 and 3.5.3**, respectively.

Net Effects

With the implementation of the above mitigation measures, permanent impacts to wildlife and wildlife habitat will be a small percentage of the entire amount present in the Study Area.

3.3.9 Significant Flora and Vegetation Communities

One Butternut tree (*Juglans cinerea*), classified as S3 vulnerable in Ontario, was identified more than 120 m from the Project Location. Due to the distance of the tree from the Project Location no potential effects will occur. The location of the tree has been submitted to the Ministry of Natural Resources.

Open, shrub and treed alvar-like vegetation communities are located throughout the Study Area.

Potential Effects

The Project will require both temporary and permanent removal of portions of alvar-like vegetation communities, and will involve the potential for construction related disturbance (dust, erosion and sedimentation, spills). Areas adjacent to constructed roads and turbine pads also have increased potential for the introduction or spread of exotic species.

Mitigation Measures

Specific mitigation strategies for alvar-like communities are summarized as follows:

- A Natural Areas Management Strategy will be developed and implemented for the Project as described in Section 6.5 of the Environmental Impact Study Report. The strategy will include:
 - A Replanting and Restoration Plan. All disturbed areas of the construction site will be restored to preconstruction grades as soon as conditions allow.
 - An Invasive Species Management Plan will be created for the Project in consultation with MNR with the goal of managing spread of the invasive species in areas of construction related disturbance.
 - A Vegetation Monitoring Plan will be created for the project to monitor the success of the Replanting Plan and the Invasive Species Management Plan.
- Records of the restoration and invasive species control work will be kept and successes or failures communicated and contributed to knowledge of alvar habitats in Ontario.
- Management efforts will be coordinated with other interest groups willing to partner that have specific knowledge of alvar habitat management and the local natural heritage of the area.
- Mitigation measures for vegetation removal will be implemented as outlined in Section 6.4.1.1 of the Environmental Impact Study Report.
- Mitigation measures for sediment and erosion control will be implemented as outlined in Section 6.4.1.2 of the Environmental Impact Study Report.
- Mitigation measures for dewatering will be implemented as outlined in Section 6.4.1.3 of the Environmental Impact Study Report.
- Where possible, and as appropriate, access roads will be constructed at or near existing grade.
- All refueling activities will occur well away from alvar communities. In the event of an accidental spill, the MOE Spills Action Centre will be contacted and emergency spill procedures implemented immediately.
- Any fuel storage and activities with the potential for contamination will occur in properly protected and sealed areas.

Mitigation measures for each alvar-like community feature are provided in Table 6.7, Appendix B of the Environmental Impact Study Report.

Net Effects

With the implementation of the above mitigation measures, permanent impacts to alvar-like vegetation communities will be a small percentage of the entire amount present in the Study Area.

3.3.10 Other Flora and Vegetation Communities

Of the native vascular plant species identified during field investigations, 216 are ranked as S5 (common, widespread, and abundant in Ontario) and 27 are ranked as S4 (uncommon but not rare).

Vegetation communities present in the Study Area are forest, cultural, swamp and marsh.

Potential Effects

The Project will require both temporary and permanent removal of vascular plants and portions of vegetation communities.

Mitigation Measures

Mitigation, replanting and restoration measures for impacts to vascular plants and natural vegetation will be implemented as outlined in Sections 6.4.1.1 and 6.5 of the Environmental Impact Study Report.

Net Effects

With the implementation of the above mitigation measures, permanent impacts to vascular plants and vegetation communities will be a small percentage of the entire amount present in the Study Area.

3.4 WATER BODIES AND AQUATIC RESOURCES

3.4.1 Groundwater

Potential Effects

Although unlikely, there is potential for groundwater to be encountered during the installation of the turbine foundations, access roads, underground collector lines and substation foundations. Groundwater seepage will have to be controlled during grubbing and stripping and during subsequent excavation and fill placement. As such, it is possible that some dewatering activities may be required.

Based on the physiography of the Study Area (predominately limestone and sand), and results of preliminary geotechnical investigations for turbine foundations, there is no indication that

significant dewatering will be expected during excavations and it is not expected that water taking will exceed 50,000 l/day.

MOE water well records indicate that numerous water wells are located in the Study Area (**Figure 3, Appendix A**). Based on regional geology the proposed on-site construction activity is expected to have minimal impact to bedrock water quality. Further, it is unlikely that water wells will be located near the turbine foundation excavation areas due to the minimum setback of 550 m of wind turbines from non-participating residences. As a result, it is anticipated that private water wells, if present, will not be affected by construction activities. The closest documented well is over 200 m from a proposed turbine foundation.

Some materials, such as fuel, lubricating oils and other fluids associated with turbine and substation construction, have the potential for discharge to the on-site environment through accidental spills.

It is not anticipated that the construction of the Project will adversely affect groundwater quality, quantity, or movement.

Mitigation Measures

If groundwater is encountered during excavations, good construction practices will be used, such as minimizing the length of time that the excavation is open and monitoring seepage into the excavation. Should pumping be required to dewater excavated areas, water will be directed into the nearest drain or spread across the buildable area and appropriate energy dissipation techniques will be used to reduce the potential for erosion and sourcing. Discharge piping will be free of leaks and should be properly anchored to prevent bouncing and snaking during surging. The rate of discharge will be monitored to ensure no erosion or flooding occurs. If energy dissipation measures are found to be inadequate, the rate of dewatering will be reduced or ceased until satisfactory mitigation measures are in place.

In terms of accidental spills or releases to the environment, undesirable materials on-site are limited to fuel, lubricating oils, and other fluids associated with turbine and substation construction. Large quantities of these materials will not be stored and do not represent a significant potential adverse effect on the groundwater in the event of accidental spills. As per S.13 of the *Environmental Protection Act*, all spills that could potentially have an adverse environmental effect, are outside the normal course of events, or are in excess of the prescribed regulatory levels will be reported to the MOE's Spills Action Centre.

A Construction Emergency Response and Communications Plan (**Section 4.0**) will be developed by the Construction Contractor and/or wpd and will include protocols for the proper handling of material spills and associated procedures to be undertaken in the event of a spill.

Net Effects

Some localized and temporary disturbance to groundwater may be possible during the excavation of the turbine foundations or installation of other Project components requiring excavation. However, it is anticipated that any potential effects will be short term in nature and have little to no effect on groundwater flow conditions or adjacent private water wells.

3.4.2 Surface Water, Fish and Fish Habitat

The presence or absence of water bodies within the Project's 120 m Zone of Investigation was assessed using the definition of a water body provided in O. Reg. 359/09, which is as follows:

"...a lake, a permanent stream, an intermittent stream and a seepage area but does not include, a) grassed waterways, b) temporary channels for surface drainage, such as furrows or shallow channels that can be tilled and driven through, c) rock chutes or spillways, d) roadside ditches that do not contain a permanent or intermittent stream, e) temporarily ponded areas that are normally farmed, f) dugout ponds, or g) artificial bodies of water intended for the storage, treatment or recirculation of runoff from farm animal yards, manure storage facilities and sites and outdoor confinement areas".

For the purposes of assessment of potential effects, this definition allowed for waterbodies to be separated into REA waterbodies, and non-REA waterbodies. Four REA waterbodies, as defined in O. Reg. 359/09, were identified within 120 m of the Project Location (**Figure 4, Appendix A**).

The following provides an assessment of potential effects and mitigation measures for all surface water features within 300m of the Project Location (see **Figure 4, Appendix A**). In accordance with O. Reg. 359/09, a WAWBR was undertaken for the Project to determine the presence of water bodies as defined by O. Reg. 359/09 and associated setbacks.

Potential Effects

Construction Activities in Proximity to Watercourses

The potential for effects on watercourses exists from soil erosion resulting from unavoidable removal of stabilizing vegetative cover, and erosion of topsoil during excavation, stockpiling, spreading and soil relocation activities. Erosion can cause downstream sediment transport and short-term increase in surface water turbidity, including associated impacts to fish and fish habitat. The magnitude and duration of potential effects to watercourses depend on the specific characteristics of each watercourse (e.g. flow regime, water velocity, bed substrates, bank conditions, local soils and the extent and duration of exposure). In addition, some materials, such as fuel, lubricating oils and other fluids associated with construction, have the potential for release to the environment in the event of accidental spills. Disturbing riparian vegetation can reduce shoreline cover, shade and food production areas. Machinery fording watercourses can

disturb bottom and bank substrates, disrupt sensitive fish life stages and introduce deleterious substances.

Watercourse Crossings

Access roads will cross ten watercourses (see **Figure 4, Appendix A**). A temporary increase in surface water turbidity may occur due to possible runoff during construction. Also, direct effects may be seen on the watercourses due to culvert crossings and from disturbance of watercourses due to crossing of collector systems.

Details on watercourse crossings are outlined in **Section 2.2.4** and the WAWBR. Similar to soil erosion, culvert installation can potentially affect surface water quality through downstream sediment transport, resulting in increased turbidity and disturbance to fish and fish habitat.

Stormwater

Stormwater runoff during construction has the potential to cause downstream sediment transport and a short-term increase in surface water turbidity, including associated impacts to fish and fish habitat.

Mitigation Measures

For the watercourse crossings, the primary mitigation is to maintain flow conveyance through the site and beneath the access road to downstream fish habitat. Standard mitigation measures for working around fish habitat are outlined in the WAWBR. Where applicable, DFO Operational Statements will be followed to protect fish and fish habitat. There are DFO Operational Statements for the following:

- High-pressure directional drilling;
- Isolated or Dry Open-cut Stream Crossings (less than 5m wide between high water marks);
- Punch and Bore Crossings;
- Overhead Line Construction; and,
- Temporary Stream Crossings.

All in-water work should be completed within MNR timing windows to protect local fish populations during their spawning and egg incubation periods. A typical construction timing window for warmwater watercourses in Peterborough District is July 1 to March 15.

Erosion and sediment control measures will be implemented during all construction activities. The contractor will obtain adequate quantities of materials in order to control erosion and sediment deposition. Additional supplies will be maintained onsite in a readily accessible location for maintenance and contingency purposes.

Required supplies may include:

- Silt fencing;
- Straw bales;
- Wooden stakes;
- Sand bags;
- Water energy dissipater;
- Filter cloth;
- Water pumps (including stand-by pumps and sufficient lengths of hose); and,
- Snow fencing with sufficient quantities of t-bars.

Erosion and sediment control measures will be installed and additional measures may be installed, at the discretion of the Construction Contractor. Barriers will be inspected regularly to ensure proper functioning and maintenance. Vegetation removal on the slopes of watercourses will be minimized to the extent possible, to reduce the risk of slope failure and siltation. Stream banks (i.e. the area between erosion control fences) will not be disturbed until necessary for construction activities. Materials removed or stockpiled (e.g. excavated soil, backfill material, etc.) will be deposited and contained in a manner to ensure sediment does not enter a watercourse.

As soon as possible following completion of the construction activity, stream banks will be restored to their original grade. Seeding will be completed during favourable climatic conditions. Once sown, seed will be protected with a layer of erosion control matting that will assist in stabilizing the slope and propagating the seed mixture. In the event that broadcast seeding is not feasible due to seasonal restrictions, hydroseeding will be considered. Erosion and sediment control measures will remain securely installed until permanent vegetation measures are successful and areas are stabilized, as determined by the Construction Contractor.

Even with properly installed erosion and siltation control measures, extreme runoff events could result in collapse of silt fencing, slope or trench failures and other problems which could lead to siltation of waterbodies. If siltation to a watercourse occurs, activities will cease immediately until the situation is rectified. The Construction Emergency Response and Communications Plan will contain procedures for spill contingency and response plans, spill response training, notification procedures, and necessary cleanup materials and equipment. As per s.13 of the *Environmental Protection Act*, all spills that could potentially have an adverse environmental effect, are outside the normal course of events, or are in excess of prescribed regulatory levels will be reported to the MOE's Spills Action Centre.

As appropriate, the Construction Contractor (or designate) will be on-site during installation of watercourse crossings to ensure compliance with specifications and site plans. In particular, the Construction Contractor will ensure that pre-construction preparation is completed prior to

commencement of in-stream work and that bank, bed, and floodplains are restored to pre-existing conditions, as possible, following completion of the construction activities.

Net Effects

The only net effect will be the ten culverts for access roads. Effects can likely be mitigated and it is unlikely that DFO authorization will be required. The application of the above mitigation measures during construction will ensure that effects to surface water due to construction activities are minimized, and that any potential net effects are spatially and temporally limited.

3.5 AIR QUALITY AND ENVIRONMENTAL NOISE

3.5.1 Air Emissions

The MOE collects ambient air quality at almost 40 monitoring sites across the province to determine the state of air quality. Monitoring stations record concentration levels of some or all of the six most common air pollutants: sulphur dioxide, ozone, nitrogen dioxide, total reduced sulphur compounds, carbon monoxide and fine particulate matter. In general, air quality in the vicinity of the Study Area is rated as “good” or “very good” during the winter months and “good” or “moderate” during the summer months. Belleville is the closest monitoring station to the Study Area, approximately 30 km to the northwest (MOE, 2010).

Potential Effects

During construction minor localized air emissions will occur from operating heavy equipment and temporary operation of portable generators. Additionally, construction related traffic and various construction activities (e.g. excavation, grading, and exposed areas) have the potential to create short-term nuisance dust effects in the immediate vicinity of the Project.

Construction activities rely on the use of a wide range of mobile equipment, such as bulldozers, dump trucks, and cranes. The engine exhaust from these vehicles, especially from those operating on diesel fuel, represent a source of particulate and other emissions (e.g. sulphur dioxide, nitrogen oxide, volatile organic compounds, polycyclic aromatic hydrocarbons, and carbon dioxide) from the construction-site. Traffic delays also result in increased emissions from vehicles traveling slowly through construction zones. The delivery of materials such as concrete to construction-sites can also generate emissions, especially for sites that are relatively far from material manufacturers.

Mitigation Measures

To reduce emissions from equipment and vehicles, several mitigation measures will be employed:

- Multi-passenger vehicles will be utilized to the extent practical;
- Company and construction personnel will avoid idling of vehicles when not necessary for construction activities;

- Equipment and vehicles will be turned off when not in use unless required for construction activities and/or effective operation;
- Equipment and vehicles will be maintained in good working order with functioning mufflers and emission control systems as available;
- All vehicles will be fitted with catalytic converters as required;
- All construction equipment and vehicles will meet the emissions requirements of the MOE and/or MTO;
- As appropriate, records of vehicle maintenance will be retained and made available for periodic review by the Construction Contractor; and
- All vehicles identified through the monitoring program that fail to meet the minimum emission standards will be repaired immediately or replaced as soon as practicable.

A Construction Traffic Management Plan will be developed by the Construction Contractor, including protocols for the management of traffic and for the delivery of materials to the construction-site (see **Section 4.0**).

Net Effects

The application of the recommended mitigation measures during construction should limit air emissions to the work areas and limit the magnitude of combustion emissions. As a result, any adverse net effects to air quality from air emissions are anticipated to be short-term in duration and highly localized.

3.5.2 Dust and Odour Emissions

Potential Effects

Construction related traffic and various construction activities (e.g. excavation, grading, soil stripping and exposed areas) have the potential to create nuisance dust effects in the immediate vicinity of the Project Location. High winds during dry weather may erode and disperse loose soil material away from the construction area, which may be a nuisance to residential properties located in close proximity to the construction sites. Storage piles exposed to wind can also be a source of fugitive dust emissions, as can various road surfaces such as unpaved roads. No odour emissions are anticipated during construction of the Project.

Mitigation Measures

To protect adjacent receptors from potential off-site dust concerns, the Construction Contractor is expected to implement good site practices during construction, including:

- Maintaining equipment in good running condition and in compliance with regulatory requirements;

- Protecting stockpiles of friable material with a barrier or windscreen in the event of dry conditions and excessive dust;
- Dust suppression (e.g. water) of source areas (will work with Prince Edward County to ensure their specific requirements for dust suppression are addressed); and
- Covering loads of friable materials during transport.

A Construction Environmental Management Plan (see Section 4.0) will be developed by the Construction Contractor and will include protocols for dust emission control and for responding to community complaints.

Net Effects

The application of the recommended mitigation measures during construction will limit fugitive dust emissions to the work areas. As a result, any adverse net effects to air quality from dust emissions are anticipated to be short-term in duration and highly localized.

3.5.3 Environmental Noise

Potential Effects

During construction of the Project, noise will be generated by the operation of heavy equipment at each of the work areas and associated vehicular traffic on-site and on haul routes. The audible noise at receptors beyond the construction areas is expected to be a minor, short-term disruption.

Mitigation Measures

To minimize inconvenience brought on by noise during the construction phase of the Project, all engines associated with construction equipment will be equipped with mufflers and/or silencers in accordance with MOE and/or MTO guidelines and regulations and requirements of the *Occupational Health and Safety Act*. Noise levels arising from equipment will also be compliant with sound levels established by the MOE.

To the greatest extent possible, construction activities that could create excessive noise will be restricted to regular construction hours and adhere to the Prince Edward County Noise/Nuisance By-law No. 900-2002 and Amending By-Law No. 2819-2011. If construction activities that cause excessive noise must be carried out outside of these time frames, adjacent residents will be notified in advance and by-law conformity will occur, as required. Sources of continuous noise, such as portable generator sets, will be shielded as appropriate or located so as to minimize disturbance to local residents.

Net Effects

Application of the recommended mitigation measures during construction will limit noise emissions to the general vicinity of the work areas. Intermittent noise could increase during

construction hours at the work areas and/or along the haul route. Any adverse net effects due to noise are anticipated to be short-term in duration and intermittent.

3.6 LAND USE AND SOCIO-ECONOMIC RESOURCES

3.6.1 Areas Protected Under Provincial Plans and Policies

No areas protected under specified Provincial Plans and Policies, such as the Greenbelt Plan, Niagara Escarpment Plan, and the *Oak Ridges Moraine Act*, are located within the Study Area. As such no potential effects will occur and no mitigation measures are necessary.

3.6.2 Existing Land Uses

Potential Effects

Prince Edward County (2006) has designated lands in the Study Area as agriculture, rural, hamlet, shore land, outdoor recreational land, environmental protection and aggregate. The predominant land use in the Study Area is natural heritage, agriculture (including crops, livestock and vineyards), residential and businesses. The communities of Milford and South Bay are located in the Study Area. Land uses are shown in **Figure 3, Appendix A**.

There is no Official Plan or Zoning By-Law amendments required for the Project in accordance with Schedule K of Bill 150 (Ontario Ministry of Energy and Infrastructure, 2009). Lands where Project infrastructure is located will be changed from present land use for the duration of the Project. During construction there will be a temporary increase in noise and dust levels around the work and haul areas resulting in a potential effects to adjacent land uses.

Mitigation Measures

Participating landowners will be compensated by wpd for land that will be utilized during the lifespan of the Project through the land lease agreements. Mitigation measures have been identified for noise and dust in **Sections 3.5.3 and 3.5.2**, respectively.

Net Effects

Although some disturbance to adjacent land uses is unavoidable during construction, it is expected to be short-term in duration, temporary, and will be minimized through the implementation of good site practices, transportation planning, and communication with the community. No significant adverse net effects are anticipated to existing land uses during construction of the Project.

3.6.3 Recreation Areas and Cultural Features

Potential Effects

The Study Area contains two Conservation Areas managed by Quinte Conservation: Milford Mill Pond Conservation Area, and Little Bluff Conservation Area (Quinte Conservation, 2012).

Recreation opportunities are also provided by the Milford Fairground and related sports facilities (Prince Edward County, 2012). One RV park and marina is located in South Bay along County Road 13. A portion of the Study Area is also designated municipally as outdoor recreational land (Prince Edward County, 2006).

There is one museum located within 300 m of the Project Location (the Mariner's Park Museum), one library (Milford), two places of worship (South Bay United Church, St. Philip's Anglican Church) and six cemeteries (Clapp, Dingman/Dingham, Mack, Milford Village, Milford Village Mill Pond, Old South Bay). The Taste Trail and the Arts Trail (Taste the County, 2012), and several wineries and art studios, are located in the Study area.

Socio-economic features can be seen on **Figure 3, Appendix A**.

Construction activities will be limited to private land and municipal road allowances, and therefore, is not expected to directly affect recreation areas or cultural features. There is, however, the possibility that increased noise, dust and traffic volumes during construction, related to construction vehicles or the operation of construction equipment, may interfere with nearby recreational uses. Refer to **Section 3.6.6** for information regarding potential effects to hunting and fishing activities in the Study Area.

Mitigation Measures

Mitigation measures related to noise, dust, and traffic are identified in **Sections 3.5.3, 3.5.2, and 3.6.7 and 3.7.1**, respectively.

Net Effects

With the application of the recommended mitigation measures during construction, any adverse net effects to recreation areas and cultural features from noise, dust and traffic are anticipated to be short term and intermittent.

3.6.4 Agricultural Lands and Operations

Potential Effects

Soils

The Project Study Area is comprised of 3377 ha (42.2%) of prime agricultural land. Agricultural soils will be disturbed as a result of construction. Activities during wet months or extended periods of heavy rainfall could have adverse impacts on agricultural lands. The movement of heavy machinery on wet soil may cause rutting, compaction, and mixing of topsoil and subsoil. These potential impacts may break down soil structure and affect soil fertility thereby reducing soil productivity. When exposed, soils are more prone to erosion. The degree of erosion is affected by the intensity and duration of rainfall and/or wind events, soil moisture, surface soil cover, slope, soil texture, structure, and organic matter content. Improperly salvaged topsoil

can result in topsoil and subsoil mixing, compaction, rutting, and erosion. This can affect re-vegetation of the construction area and potentially decrease crop yields.

Artificial Drainage

No artificial tile drainage is known to occur in the Study Area.

Soybean Cyst Nematode

While its presence has not been confirmed in agricultural lands anticipated to be traversed by Project construction, the soybean cyst nematode (SCN) has been identified in parts of Eastern Ontario (OMAFRA, 2002). Once a field has been infested, there is significant potential for soybean crop loss and there is no effective method of eradicating SCN. During construction requiring soil disturbance, equipment will be transported from field to field, and thus there is potential for transportation of SCN-contaminated soil to non-infested fields.

Livestock

Impacts to livestock during the construction phase of the Project are anticipated to be minimal. It is advised that the construction team and property/livestock owners maintain regular communication in order to ensure a minimum level of impact on livestock.

Mitigation Measures

Siting of turbines, substations, collector lines and access roads has been completed with the approval of the participating landowner to minimize disturbance to existing agricultural lands and operations. Construction activities will be restricted to the delineated construction areas. Disruption to drainage ditches, culverts, field entrances, and fences will be repaired appropriately.

Soils

Where agriculturally productive lands are impacted by heavy rainfall events and wet soil conditions, wpd will implement a wet soil shutdown practice; if conditions deteriorate to a situation where ruts under vehicles become deep enough to cause topsoil/subsoil mixing or create excessive compaction or make topsoil/subsoil separation too difficult, those activities will cease. Construction activities will continue when conditions improve and those soil qualities are protected. wpd will retain a Soil Inspector to monitor the implementation of the wet soil shutdown and start-up, and to serve as a point of communication with landowners.

In areas where activity on agricultural land will be for the duration of the construction only, the Construction Contractor will monitor topsoil stripping to ensure that the correct depth of topsoil is removed and stockpiled in a manner that avoids mixing with subsoil material. Stone picking will occur before and after topsoil replacement and during cleanup.

Following the completion of construction, as appropriate, temporary workspaces will be graded and de-compacted (if required), the topsoil replaced, and the area left as close to pre-existing condition as possible. The option of de-compacting soil with an agricultural subsoiler, followed by discing, chisel ploughing or cultivating, to smooth the surface, may be considered on a site-specific basis by an environmental advisor. Soil density and/or penetrometer measurements may be used as a means of assessing the relative degree of soil compaction and to determine if additional compaction relief is required.

Where there is potential for erosion or where erosion has already developed, silt fence and straw bales (or appropriate substitutes) will be installed to reduce soil transport. The location of such protection measures will be determined by the Construction Contractor. Topsoil salvage and/or replacement should be avoided during heavy precipitation or extremely windy conditions. Silt control fencing should be installed and maintained throughout construction and restoration until lands are fully stabilized.

Soybean Cyst Nematode

A pre-construction soil sampling program will be implemented to identify potential SCN infestation. The pre-construction program will include soil analysis for each agricultural row crop field to determine the extent of SCN infestation.

Any field identified to contain SCN will be recorded and the location provided to the Construction Contractor. Additionally, any imported topsoil will have a composite sample analyzed for SCN before it is used during construction. If SCN fields are identified, appropriate mitigation measures will be developed. Examples of mitigation measures may include washing stations for equipment, and/or restricted access to fields.

Livestock

The construction team and property/livestock owners will maintain regular communication in order to ensure a minimum level of impact on livestock during construction. In areas where agricultural land may be used by livestock, it will be necessary to erect temporary fencing around the workspaces, install gates to accommodate access through pasturelands, and/or move the livestock to different fields for short periods of time. This requirement will be determined in consultation with the landowner prior to the commencement of construction and wpd will bear the cost of any such requirements.

Net Effects

Adverse net effects to agricultural lands and operations are expected to be temporary and spatially limited. However, as appropriate, temporary construction areas will be rehabilitated following construction and restored to agricultural use.

3.6.5 Mineral, Aggregate, and Petroleum Resources

Potential Effects

No mineral resource extraction is known to occur in the Study Area. Lands designated for aggregate resource extraction are present in the Project Study Area (Prince Edward County, 2006); however Project works will not be located on these lands, and as such no potential effects are anticipated.

Three abandoned petroleum wells are located in the Study Area (**Figure 3, Appendix A**). Correspondence with the Petroleum Resources Centre of the Ministry of Natural Resources has indicated that the Project infrastructure is outside of the 75 m setback of these petroleum resources, and therefore no potential effects are anticipated. In the event of unknown petroleum resources being encountered, construction activities of any type in the vicinity of uncapped or leaking gas wells have the potential for unlikely but severe consequences due to ignition of the gas or rupture of the well.

Mitigation Measures

As no potential effects are anticipated to mineral or aggregate resources, no mitigation measures are necessary.

Utility locates will be conducted prior to construction to identify unrecorded, improperly decommissioned wells.

Net Effects

No adverse net effects are anticipated to mineral, aggregate and/or petroleum resources during construction of the Project.

3.6.6 Game and Fishery Resources

Potential Effects

There is potential for the Project to create access to previously inaccessible areas, due to the construction of access roads.

Sensory disturbance to game species may occur during the construction phase due to noise. A certain level of sensory disturbance to wildlife in the Study Area already exists from ongoing agricultural, rural, and domestic activities.

Mitigation Measures

wpd will work with the Ministry of Natural Resources and participating landowners should access roads be found to act as means of access for illegal hunting during construction.

It is anticipated that those who participate in hunting, fishing and other outdoor recreation activities will choose an alternate location for their recreation during times when construction will take place. Mitigation measures related to noise are identified in **Section 3.5.3**.

Net Effects

Due to the siting of access roads on private land, any increased access for hunting during construction will be illegal and is thus anticipated to be an infrequent occurrence.

Any adverse net effects on game and fishery resources due to construction noise are anticipated to be temporary and intermittent.

3.6.7 Local Traffic

Potential Effects

There is potential for an increase in traffic during construction on municipal roads due to a commuting workforce, the transport of Project components, construction machinery, equipment and supplies, and the removal of excess materials and waste from the Study Area. In addition, transport of Project equipment and supplies will include carrying excess loads and large turbine components. Truck trips will be noticeably reduced after the access roads and foundations have been installed and the turbine components are on-site. The increase in traffic, including excess load traffic, may result in short-term, localized disturbance to traffic patterns, an increase in traffic volume, and create potential traffic safety hazards.

Mitigation Measures

The Construction Contractor will implement a Traffic Management Plan to identify and deal with specific traffic planning issues including the management of traffic and the delivery of materials (see **Section 4.0**).

Net Effects

Truck traffic will increase on some roads during turbine and other component deliveries, but will be restricted to predetermined routes and times to the greatest extent possible. Road safety is not expected to be an issue during the construction phase; however, the potential for accidents along the haul routes and on-site cannot be totally avoided.

While truck traffic will increase during certain phases of construction, the effect of construction on local traffic will be temporary and short term, and mitigated through the Traffic Management Plan.

3.6.8 Local Economy

Potential Effects

Construction of the Project is expected to begin 6-12 months after REA approval. During construction, the actual number and make-up of those employed will vary over time as the Project goes through the various construction phases.

Construction of the Project will also result in indirect and induced employment, the majority of which is anticipated to be filled by local businesses. Indirect employment is jobs and income in other businesses/industries in the community that supply inputs to the Project and Project employees. Induced employment includes jobs and income changes occurring in other businesses/industries in the community from spending activities of directly and indirectly employed individuals.

To the extent possible, local hiring will be maximized during the construction period providing work for existing qualified tradespersons and labourers. Trades that could be provided locally may include heavy equipment operators, truck drivers, pipefitters, electricians, ironworkers, millwrights and carpenters.

Since it is likely that the labour force will be supplied through local and neighbouring communities no special housing, healthcare or food facilities will be required as part of the Project construction activities.

While the increased number of personnel present in the area during construction will increase the demand for some goods and services from the local area (e.g. lodging, food, and banking), the demand is expected to be nominal and short-term. This demand will also generate local benefits to business and services from Project spending.

Potential disruption to use and enjoyment of businesses may occur within the Study Area during construction. Potential disruptions could be caused by physical effects from traffic noise (**Section 3.5.3**) and dust (**Section 3.5.2**). Potential effects to existing land uses due to Project construction activities are discussed in **Section 3.6.2**.

Mitigation Measures

To the extent possible and/or the Construction Contractor will source required goods and services from local qualified suppliers where these items are available in sufficient quantity and quality and at competitive prices.

The Construction Contractor will implement a Traffic Management Plan, as described in **Section 4.0**, to identify and deal with specific traffic planning issues including the management of traffic and the delivery of materials. The program may include the use of signage, road closures, speed restrictions, truck lighting, load restrictions, and equipment inspections.

Disruptions in the vicinity of local businesses will be largely due to an increase in traffic, and will be short term and are not expected to affect use of these businesses.

Section 3.6.2 describes the mitigation measures for reducing the impact of construction activities on existing land uses.

Net Effects

A positive net effect is anticipated on the local economy during construction of the Project. The Project provides positive income, employment, and fiscal benefits to the local area, including Prince Edward County and participating landowners. The County will receive ongoing property tax income from the Project and participating landowners will receive land lease payments. A nominal increase in municipal services is possible for Prince Edward County. Existing businesses within local communities could benefit from the demands of the Project workforce during construction.

3.7 EXISTING LOCAL INFRASTRUCTURE

3.7.1 Provincial and Municipal Infrastructure

Potential Effects

There are no provincial highways, airports, harbours or rail lines in the Study Area. One RV park and marina is located in South Bay along County Road 13. One electrical transmission line is located east of Johnston Road, north of Bond Road, which travels north from the Milford Distribution Station. The Picton TS is located across the road from the northern substation on County Road 5. Municipal roads are classified hierarchically as Intercentre/Arterial Connectors (County Road 5, County Road 10 and County Road 17), County Collectors (County Road 13, County Road 24) and rural service roads (Prince Edward County, 2006). Transportation of excess loads and large turbine components may produce abnormal wear on the local roads.

Mitigation Measures

The Construction Contractor will implement a Traffic Management Plan (see **Section 4.0**) as described in **Section 2.6**. Detailed plans or agreements regarding maintenance and/or repairs of the local roads damaged during construction will be developed with the County.

If tree removal is required along the municipal road allowance, the County will be consulted to ensure adherence to municipal requirements.

wpd will undertake consultation with the County regarding any necessary agreements related to wear on roads from transportation of Project materials in addition to obtaining the required permits for use of County roads. County requirements will be adhered to for constructing new entrances off County roads and locating the substations.

Permits from the MTO may be required to facilitate the component transportation on provincial highways outside of the Study Area. It is not anticipated that the additional traffic on the provincial highways will cause any significant traffic congestion.

Mitigation measures for drains are discussed in **Section 3.4.2**. County staff will attend site visits and be part of the discussions with Quinte Conservation during the *Fisheries Act* permitting process for the Project.

Net Effects

Abnormal wear on roads is possible, though unlikely, following mitigation measures and upgrades that may be required to roads prior to transportation of Project components. Truck traffic will increase on some roads during turbine and other component deliveries; however this traffic will be restricted to predetermined routes and times to the greatest extent possible. Road safety is not expected to be an issue during the construction phase; however the potential for accidents along the haul routes and on-site cannot be totally avoided. Abnormal wear on roads is also possible, though unlikely on provincial highways.

The effect of constructing the various Project components is anticipated to have a limited, short term effect on traffic during construction. No other effects are anticipated during construction of the Project to other provincial or major infrastructure.

3.7.2 Utilities

Potential Effects

Municipal road allowances will be used for the siting of electrical collector lines, and therefore the potential exists for interference with local utilities.

Mitigation Measures

Wpd will consult with local utility providers to ensure the location of all utilities is known, and no effects will occur. In the event that any unidentified utilities are damaged during the construction of the Project, wpd will pay for repairs. Detailed plans or agreements regarding the use of road allowances for electrical collector lines will be developed with the County.

Wpd will obtain all necessary permits and authorizations for connection into the HONI system.

Net Effects

As a result of obtaining all necessary permits, no net effects are anticipated to utilities as a result of Project construction.

3.7.3 Navigable Waters

No navigable waters are located within the Project Location. As such no potential effects will occur and no mitigation measures are necessary.

3.8 WASTE MANAGEMENT AND CONTAMINATED LANDS

Potential Effects

Landfill Sites

No landfill sites are located within the Study Area (Prince Edward County, 2006). As such no potential effects will occur and no mitigation measures are necessary.

Contaminated Lands

The Study Area contains one contaminated site (**Figure 3, Appendix A**). As any Project activities within vicinity of the site will occur within existing disturbed road allowance, no potential effects area anticipated. The Study Area is predominately rural and agricultural in nature; however, the possibility of encountering contaminated lands cannot be completely ruled out.

Waste Generation

Waste materials expected to be generated during construction are described in **Section 2.8**, and will be temporarily stored on-site and will require reuse, recycling, and/or disposal at an appropriate MOE-approved off-site facility. Improper disposal of waste material generated during construction may result in contamination to soil, groundwater, and/or surface water resources on and off the Project sites. Litter generated during construction may also become a nuisance to nearby residences if not appropriately contained and allowed to blow off the construction-site.

Spills

Some materials, such as fuel, lubricating oils and other fluids associated with construction, have the potential for discharge to the on-site environment through accidental spills.

Mitigation Measures

In the event that previously unknown contaminated soils, such as buried tanks, drums, oil residue or gaseous odour, are uncovered or suspected of being uncovered, construction will cease in that location until the source of the contamination is further investigated. In such an instance, wpd will retain expert advice on assessing and developing a soil sampling, handling and remediation plan. All contaminated material will be managed in accordance with the applicable sections of the *Environmental Protection Act* and Regulation 347.

During construction, the Construction Contractor will implement a site-specific waste collection and disposal management plan, which may include site practices such as:

- systematic collection and separation of waste materials within weather-protected on-site storage areas;

- all waste materials and recycling will be transported off-site by private waste material collection contractors licensed with a Certificate of Approval – Waste Management System;
- contractors will be required to remove their excess materials from the site (e.g. extra cable, formwork, scrap metals, pallets, etc.);
- excess materials generated during the course of construction excavations of soil will be handled in accordance with the MOE's Protocol for the Management of Excess Materials in Road Construction and Maintenance;
- excess excavated soils may be reused elsewhere on the property with landowner permission;
- labelling and proper storage of hazardous and liquid wastes (e.g. used oil, drained hydraulic fluid, and used solvents) in a secure area that will ensure containment of the material in the event of a spill. As per S.13 of the *Environmental Protection Act*, all spills that could potentially have an adverse environmental effect, are outside the normal course of events, or are in excess of the prescribed regulatory levels will be reported to the MOE's Spills Action Centre;
- dumping or burying wastes within the Project sites will be prohibited;
- should contaminated soil be encountered during the course of excavations the contaminated material will be disposed of in accordance with the current appropriate provincial legislation, such as Ontario Regulation 347, the General – Waste Management Regulation;
- disposal of non-hazardous waste at a registered waste disposal site(s);
- if waste is classified as waste other than solid non-hazardous, a Generator Registration Number is required from the MOE and the generator will have obligations regarding manifesting of waste. Compliance with Schedule 4 of Regulation 347 is mandatory when determining waste category;
- implementation of an on-going waste management program consisting of reduction, reuse, and recycling of materials; and
- disposal of sanitary wastes will be the responsibility of the contracted third party and they will ensure disposal in accordance with appropriate legislation, standards and policies.

The cement provider will be responsible for ensuring that wash water from the cleaning of cement truck drums is disposed of in a sewage works designed for that purpose and approved under Section 53.(1) of the *Ontario Water Resources Act*, or under Part 8 of the *Building Code Act*.

In terms of accidental spills or releases to the environment, standard containment facilities and emergency response materials will be maintained on-site as required. Refuelling, equipment

maintenance, and other potentially contaminating activities will occur in designated areas, and as appropriate spills should be reported immediately to the MOE Spills Action Centre.

Construction waste management plans will be developed by the Construction Contractor and will include protocols for the reuse, recycling and/or disposal of solid, hazardous and sanitary waste. See **Section 4.0** for more information on the Construction Waste Management Plans.

Net Effects

With the application of the mitigation measures outlined above, no net effects are anticipated on-site during construction. In terms of waste disposal, it is possible that there will be a minor incremental effect on soil, groundwater, and surface water at the waste disposal site(s) depending on municipal on-site containment practices and quality of the landfill protection mechanisms (e.g. use of geotextiles to contain leachate). It is assumed that licensed waste disposal sites are legally compliant.

3.9 PUBLIC HEALTH AND SAFETY

Potential Effects

Potential effects to public health and safety are largely in the form of increased construction related traffic (**Sections 3.6.7** and **3.7.1**), dust emissions (**Section 3.5.2**), construction noise (**Section 3.5.3**) and unauthorized access of the public to the work sites.

Mitigation Measures

Implementing transportation planning and safety measures during construction will minimize the potential for traffic related safety concerns. A detailed Traffic Management Plan and a detailed Health and Safety Plan (**Section 4.0**) will be prepared and implemented by the Construction Contractor.

An Emergency Response and Communications Plan will be developed for the Project, including the construction phase, and is outlined in greater detail in the Design and Operations Report.

Mitigation measures for dust emissions and construction noise are provided in **Sections 3.5.2** and **3.5.3**, respectively.

Land access to the construction-site will be controlled through signage and restricted to authorized personnel only. The Construction Contractor will also employ good site safety practices during the construction phase. The detailed Health and Safety Plan referenced above will consider both public and occupational health and safety issues. This may include protecting the public from equipment and construction areas by posting warning signs, use of personal protective equipment, accident reporting, equipment operation, and confined space entry. Discussions have been undertaken, and will continue, with local emergency services personnel. wpd will participate in a training session for these workers.

Net Effects

With proper protection and mitigation measures, and adherence to wpd's safety policies and procedures, there is minimal increased or new risk to public health and safety from construction of the Project.

4.0 Construction Environmental Management Plan

Although not a requirement of O.Reg. 359/09, the Construction Contractor, with oversight from wpd, will prepare a Construction Environmental Management Plan (CEMP) prior to the initiation of any substantive on-site works. The CEMP will be the controlling plan for all construction activities, and will be designed to minimize potential adverse environmental effects, while enhancing the Project's benefits. The CEMP will be based on the environmental effects and mitigation measures identified in this report, and related reports to be submitted as part of the REA application. As part of the construction program, site practices and procedures will be implemented to further reduce the environmental effects identified in this report and supporting studies. These practices may include specifications regarding disposal of excavated material, sediment control, dust control, and soil compaction control. In addition, wpd staff and contractors will be made aware of the environmental commitments contained in this report and supporting studies to ensure the commitments are implemented.

The Project CEMP will include procedures and plans based on regulatory requirements and accepted site practices and as appropriate will include the following plans:

- *Traffic Management Plan*: the Construction Contractor and/or the turbine manufacturer will develop and implement this plan, which will contain strategies governing movement of materials and personnel to, from, and within the workspace areas; management of connection points between access roads and public roads; transport of abnormal loads; control of any upgrading/modification road works; and/or dust and vehicle emission controls.
- *Hazardous Waste Management Plan*: to outline the procedures for proper identification, storage, handling, transport, and disposal of hazardous waste. In addition, the procedures will outline specific requirements for personnel training, emergency response, product review and approval, and record keeping.
- *Non-hazardous Waste Management Plan*: to establish alternative procedures for the management and disposal of non-hazardous waste such as used lubricants, used drums, and general waste with specific provisions for reuse and recycling of waste materials.
- *Health and Safety Plan*: the Construction Contractor will prepare this plan considering both public and occupational health and safety issues. This may include protecting the public from equipment and construction areas by posting warning signs, use of personal protective equipment, accident reporting, equipment operation, and confined space entry.
- *Construction Plan*: wpd will develop construction specifications that will form part of the construction contract. These specifications will detail the specific techniques and

procedures to be followed to implement the mitigation recommendations contained in this report and supporting reports and studies.

- *Emergency Response and Communications Plan:* the Construction Contractor and/or wpd will include a plan for the proper handling of material spills and associated procedures to be undertaken during a spill event. The plan will also specify containment and clean-up materials and their storage locations. The plan will include general procedures for personnel training. As appropriate, the plan may cover response actions to high winds, fire preparedness, evacuation procedures, and medical emergencies. This plan will be developed in consultation with local emergency services personnel to determine the extent of emergency response resources and response actions of those involved. The plan will include key contact information for emergency service providers, a description of the chain of communications and how information will be disseminated between wpd and/or the Construction Contractor and the relevant responders.
- *Training Plan:* as appropriate, this will involve the training/informing of construction personnel on the unique features of the above plans prior to construction.
- *Complaint Response Protocol:* wpd will continue its pre-construction contact with Project stakeholders during construction and through the initial period of operation as long as this seems an effective two-way channel for communication. wpd and/or the Construction Contractor may consider developing and implementing a Complaint Response Protocol for the construction phase to address any reasonable concern from the public. This protocol should provide a telephone number for contact at wpd. Any telephone number provided to the public for reporting of complaints should be equipped with a voice message system. wpd will endeavour to respond to messages within 48 hours. All reasonable commercial efforts should be made to take appropriate action as a result of actual concerns as soon as practicable. Should such a protocol be developed, wpd will consider posting it on the Project website (<http://canada.wpd.de/projects/in-canada/whitepines.html>) and/or providing it directly to the County and the MOE.

wpd will provide overall direction and assume responsibility for the development and implementation of these plans.

5.0 Construction Environmental Effects Monitoring Plan

The Construction Contractor will be the primary party responsible for the implementation of construction environmental effects monitoring measures. Implementation of these measures will be undertaken in a manner that is consistent with wpd's standard environmental and engineering practices and in compliance with applicable municipal, provincial, and federal standards and guidelines. The following subsections outline the key monitoring activities to be implemented.

5.1 TERRESTRIAL HABITATS

Methodologies/Sampling Protocols

The majority of monitoring for terrestrial habitat impacts will occur post-construction, during operations. Construction activities that have the potential to affect terrestrial flora and fauna include vegetation clearing and disturbance, accidental spills and/or leaks, and waste disposal. Stringent monitoring of these activities is necessary to ensure terrestrial flora and fauna are protected.

Vegetation clearing activities will be conducted under constant observation and monitoring of the Construction Contractor to ensure that vegetation is cleared only from designated areas. Areas outside the designated construction-sites shall not be disturbed.

Monitoring will be required following the unlikely event of contamination from an accidental spill or leak. Contaminated soils will be removed and replaced as appropriate. All such activities will follow procedures outlined in the Emergency Response Plan for the CEMP (see **Section 4.0**).

As appropriate, records of waste generation and hauling will be maintained. Where a third party's activities are identified as non-compliant or insufficient, the Construction Contractor will seek out an alternative recycling or disposal solution.

Performance Objectives/Additional Actions

Provided mitigation measures outlined in **Section 3.0** are implemented, and monitoring as outlined above occurs, it is anticipated that environmental disturbance will have been contained and that no additional monitoring actions will be required.

5.2 GROUNDWATER

Methodologies/Sampling Protocols

The presence of recently drilled or non-documented water wells has been confirmed, and will be further investigated with participating landowners. In the event that a turbine is located within 100 m of the private residential well of a participating landowner, the Construction Contractor may, at the landowner's request, hire a hydrogeologist to undertake monitoring of the quality

and quantity of these wells over the course of construction. The hydrogeologist will develop a well monitoring program to address potentially affected wells.

Performance Objectives/Additional Actions

In the event that well water quality or quantity is disturbed as a result of construction, as determined by the hydrogeologist, wpd will provide a temporary potable water supply until corrective measures are taken and will comply with MOE's *Guideline B-9: Resolution of Groundwater Interference Problems*. All corrective measures, including determination of when corrective measures are no longer required, will be outlined in the well monitoring program to be developed by the hydrogeologist.

5.3 AQUATIC HABITATS

Methodologies/Sampling Protocols

As appropriate, a Construction Contractor representative will be on-site during installation of Project components that could potentially affect aquatic habitats to ensure compliance with specifications, site plans and permits. In particular, the Construction Contractor will ensure that pre-construction preparation is completed prior to commencement of in-stream work (if required). Where required and if applicable, the Construction Contractor will ensure that detailed pre-construction profiles of the slopes, banks, and bed are determined prior to installation of the access roads, crane paths and power lines. The Construction Contractor will monitor weather forecasts prior to the installation of access roads, crane paths and power lines, particularly prior to work near aquatic habitats.

Performance Objectives/Additional Actions

The Construction Contractor will ensure that bank, bed, and floodplain conditions are restored to pre-construction conditions, as possible, following completion of the construction activities.

Environmental inspection following spring run-off the year after construction (first year of operations) may also be considered to review the effectiveness of the bank and slope re-vegetation (if required), to check bank and slope stability, and to ensure surface drainage has been maintained. In the event that adverse effects are noted, appropriate remedial measures will be completed as necessary (i.e. such as site rehabilitation and revegetation) and additional follow-up monitoring conducted as appropriate, under the direction of an environmental advisor.

Additionally, compensation strategies and/or permits from Fisheries and Oceans Canada and/or Quinte Conservation, as applicable, will likely include conditions of approval such as construction and post-construction monitoring. All such strategies and/or permits will be obtained prior to construction, and all such conditions and requirements will be implemented.

5.4 AGRICULTURAL LANDS

Methodologies/Sampling Protocols

For a period of one year after restoration of temporary work areas on agricultural lands, potential soil problem areas including subsidence, soil erosion and/or stoniness will be visually monitored by a soil specialist (such as a professional agrologist), or as per agreements with the landowner. Monitoring of the above mentioned soil issues is usually conducted during the spring, the year after construction, so that the area has had a chance to over-winter. These issues are usually identified during a site visit once the soil is dry enough to traverse by foot, but before the land owner has been on the fields to cultivate and seed for next year's crop.

Performance Objectives/Additional Actions

If adverse impacts are noted during the above post-construction monitoring, appropriate remediation measures will be developed by the soil specialist, or as per agreements with the landowner. These mitigation measures may include, but are not limited to, soil re-grading or importation to correct the effects of subsidence, re-grade or import soil to mitigate soil erosion issues, and surface pick excess stones as required. wpd will be responsible for the implementation of all necessary mitigation measures. Additional follow-up monitoring will be conducted, under supervision of the soils specialist, until adverse impacts are no longer evident. Additional monitoring in representative locations may include measurement of soil physical and chemical properties (soil compaction, soil fertility and soil organic matter levels).

5.5 PUBLIC ROADS

Methodologies/Sampling Protocols

County roads will be restored to their pre-construction conditions to the satisfaction of local authorities as applicable to the agreement with the County. Some municipal roads requiring structural enhancement/upgrades may be left in their upgraded form if requested. For a period of one year after construction (first year of operations), roads will be monitored following a heavy rain event and following spring runoff, as defined by applicable agreements, to ensure no erosion, bank slumpage, road subsidence or major rutting has occurred as a result of construction activities. As appropriate, affected roadside ditches and drains will be repaired if required and monitored to ensure that they are functioning properly.

Performance Objectives/Additional Actions

If adverse impacts are noted during the above post-construction monitoring, appropriate remediation measures will be developed as per applicable agreements. As appropriate, affected road substrate will be repaired and roadside ditches and drains will be revegetated. Additional follow-up monitoring will be conducted, as per applicable agreements, until adverse impacts are no longer evident.

5.6 AIR QUALITY AND DUST

Methodologies/Sampling Protocols

As appropriate, records of vehicle maintenance will be retained and made available for periodic review by the Construction Contractor. All vehicles identified through the monitoring program that fail to meet the minimum emission standards will be repaired immediately or replaced as soon as practicable from the construction area.

The Construction Contractor will monitor to ensure that temporary topsoil storage piles are stabilized with appropriate means.

Performance Objectives/Additional Actions

Provided mitigation measures outlined in **Section 3.0** are implemented, and monitoring as outlined above occurs, it is anticipated that environmental disturbance will have been contained and that no additional monitoring actions will be required.

6.0 Conclusion and Signatures


This Construction Plan Report for the White Pines Wind Project has been prepared by Stantec for wpd in accordance with Item 1, Table 1 of Ontario Regulation 359/09 and the MOE's *Technical Guide to Renewable Energy Approvals* (2012).

This report has been prepared by Stantec for the sole benefit of wpd, and may not be used by any third party without the express written consent of wpd. The data presented in this report are in accordance with Stantec's understanding of the Project as it was presented at the time of reporting.

STANTEC CONSULTING LTD.



Mark Knight, MA, MCIP, RPP
Project Manager



Shawna Peddle, MSc.
Senior Project Manager

7.0 References

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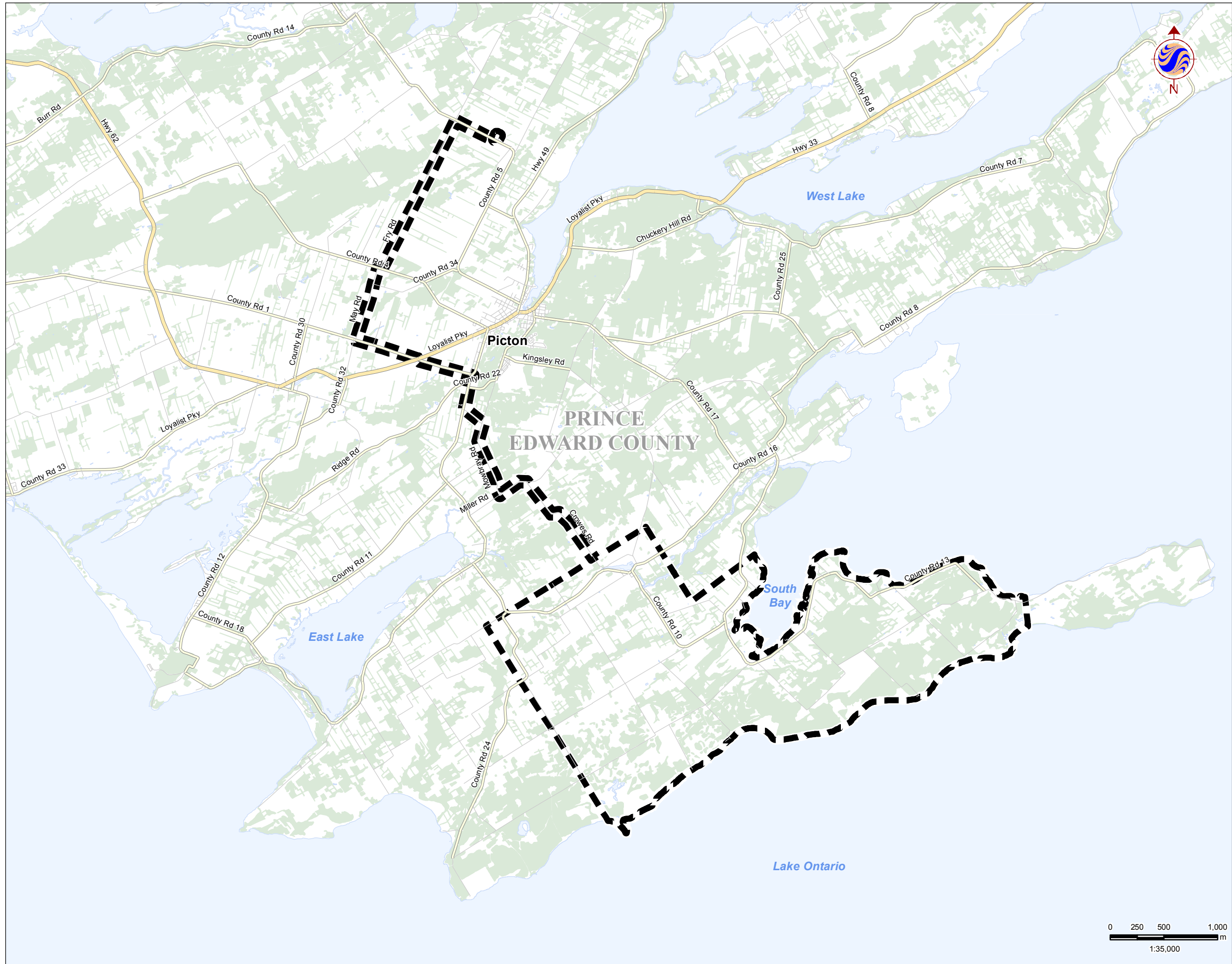
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Appendix A

Figures



Legend

-  Project Study Area
-  Highway
-  Major Road
-  Local Road
-  Waterbody (MNR)
-  Woodland (MNR)



Notes

1. Coordinate System: NAD 1983 UTM Zone 18N
2. Base features produced under license with the Ontario Ministry of Natural Resources © Queen's Printer for Ontario, 2011.



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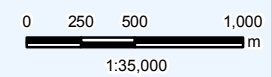
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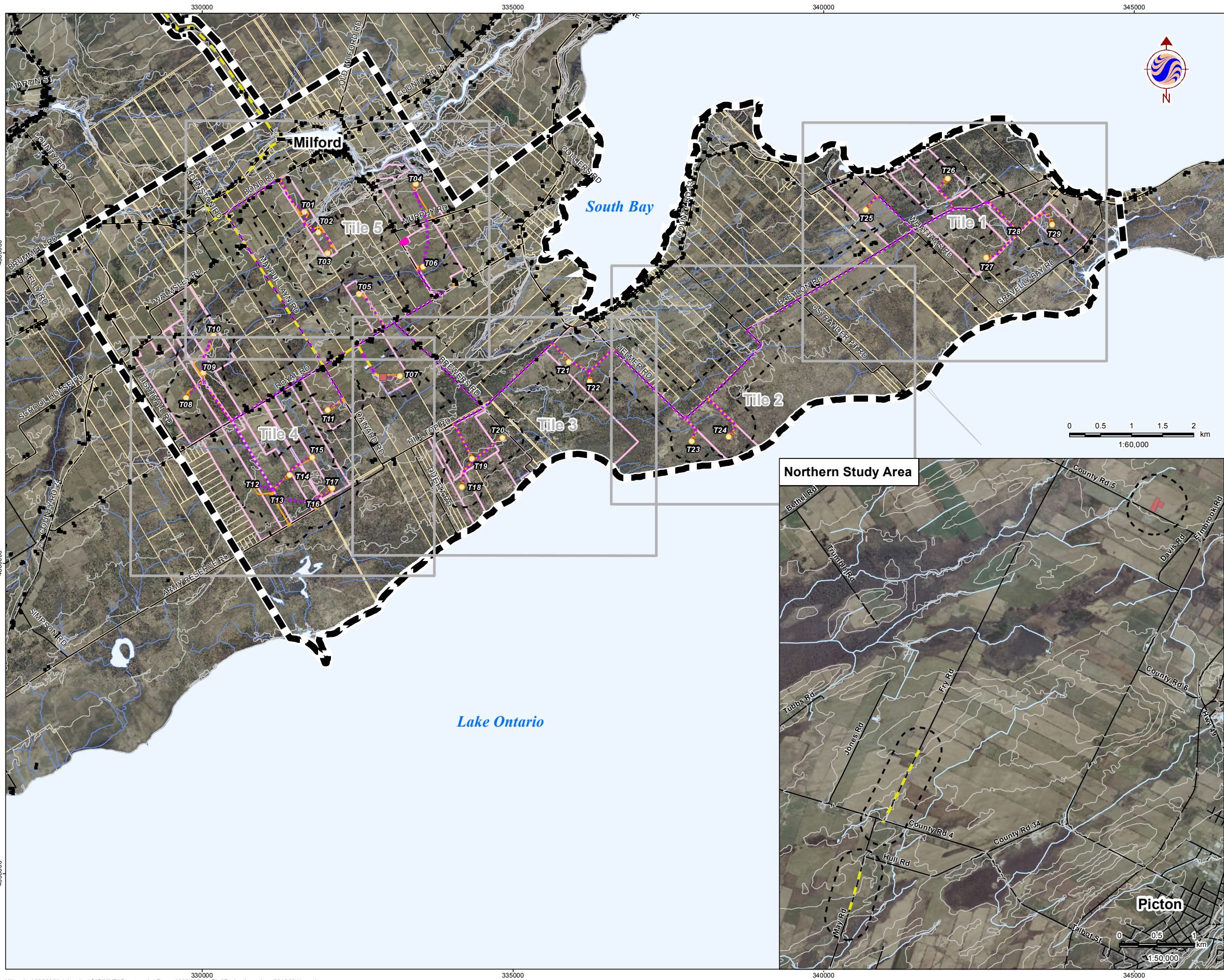
Figure No.

1.0

Title

Project Study Area





Legend

- Study Area
- 300m Zone of Investigation
- Proposed Project Components**
- Wind Turbine (Blade Sweep)
- Access Road
- Collector Line
- Interconnection Line
- Construction Area
- Turbine Laydown Area
- Crane Laydown Area
- Substation
- Storage Area
- Optioned Properties
- Existing Features**
- Road
- Railway
- Contour Line (5 meter intervals)
- Property Line
- Building
- Waterbody (as per MNR base mapping)
- Watercourse (as per MNR base mapping)

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Data Sources: Ontario Ministry of Natural Resources, © Queens Printer Ontario, 2011; © Natural Resources Canada, 2011; © WPD Canada, 2011; © Prince Edward County, 2011.
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Figure No.
2.0

Title
Project Location



Legend

- Study Area
- 300m Zone of Investigation
- Proposed Project Components**
- Wind Turbine (Blade Sweep)
- Access Road
- Collector Line
- Interconnection Line
- Construction Area
- Turbine Laydown Area
- Crane Laydown Area
- Substation
- Storage Area
- Buildable Area
- Optioned Properties
- Existing Features**
- Road
- Railway
- Contour Line (5 meter intervals)
- Property Line
- Building
- Waterbody (as per MNR base mapping)
- Watercourse (as per MNR base mapping)
- Setbacks**
- Road Setback- Blade Tips Plus 10m (55.2m)
- Property Line Setback (100m)

Notes

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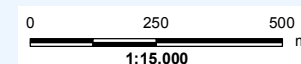
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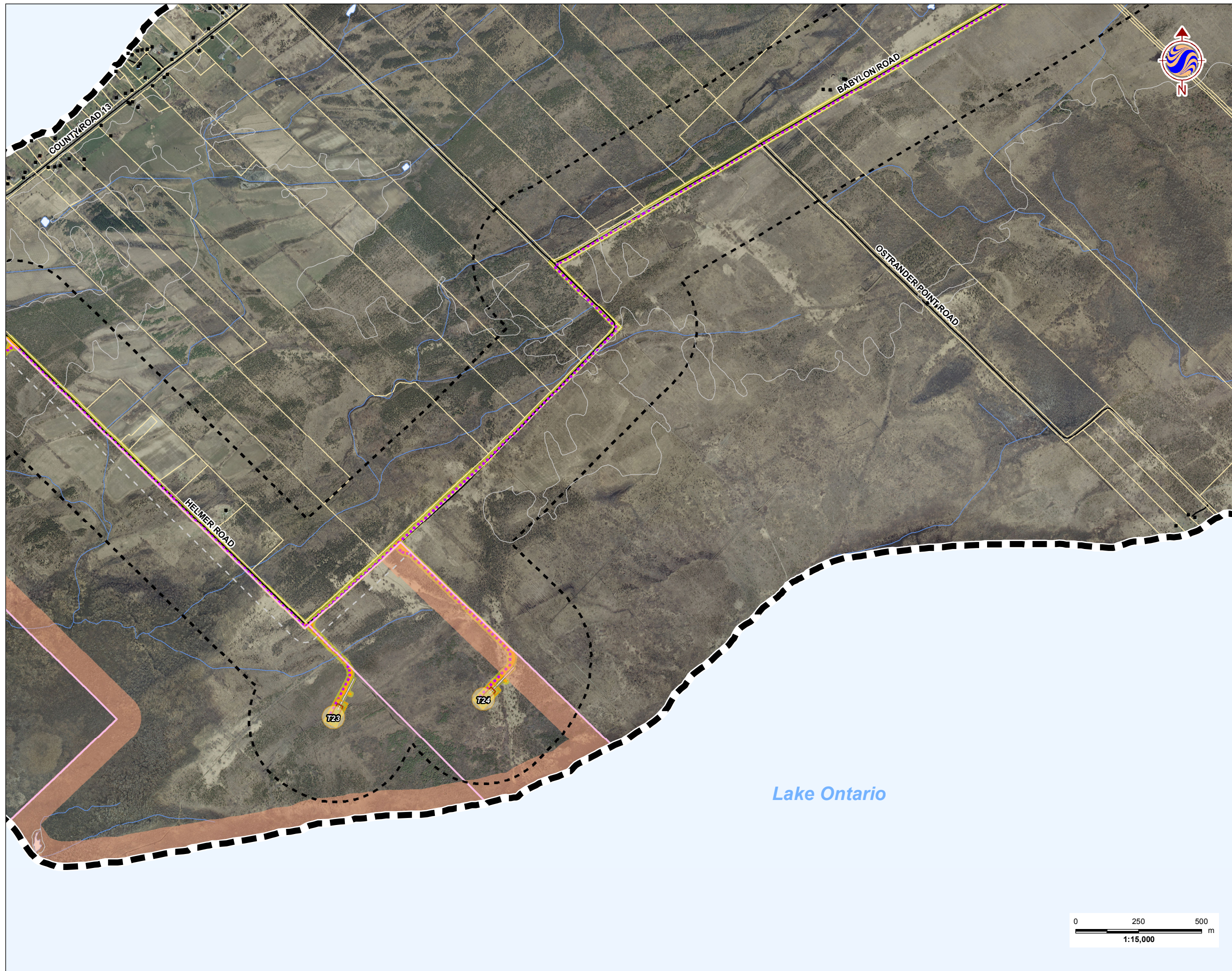
Figure No.

2.1

Title

Project Location
Tile 1





Legend

- Study Area
- 300m Zone of Investigation
- Proposed Project Components**
- Wind Turbine (Blade Sweep)
- Access Road
- Collector Line
- Interconnection Line
- Construction Area
- Turbine Laydown Area
- Crane Laydown Area
- Substation
- Storage Area
- Buildable Area
- Optioned Properties
- Existing Features**
- Road
- Railway
- Contour Line (5 meter intervals)
- Property Line
- Building
- Waterbody (as per MNR base mapping)
- Watercourse (as per MNR base mapping)
- Setbacks**
- Road Setback- Blade Tips Plus 10m (55.2m)
- Property Line Setback (100m)

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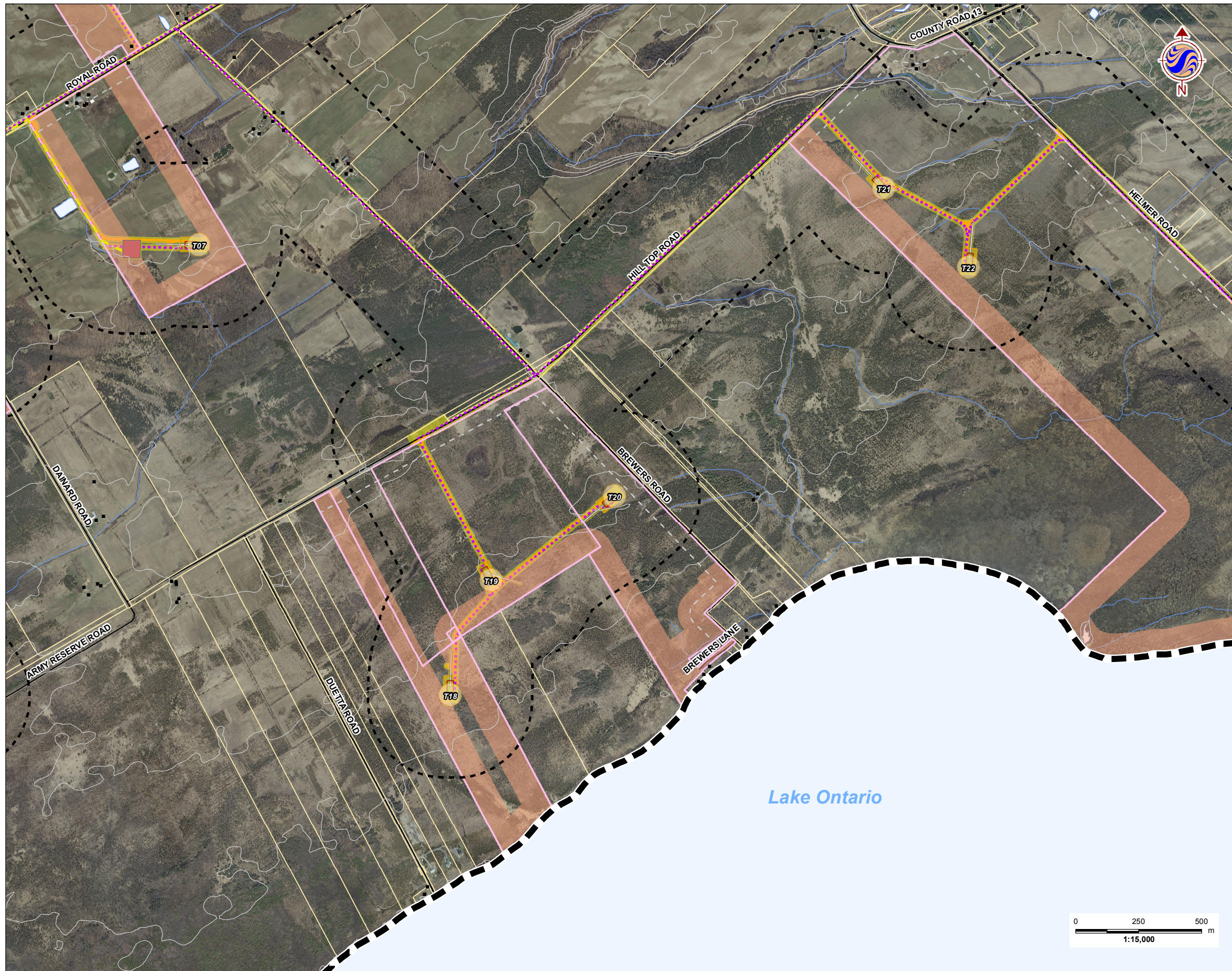
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Figure No.

2.2

Title

Project Location
Tile 2



Legend

- Study Area
- 300m Zone of Investigation
- Proposed Project Components**
- Wind Turbine (Blade Sweep)
- Access Road
- Collector Line
- Interconnection Line
- Construction Area
- Turbine Laydown Area
- Crane Laydown Area
- Substation
- Storage Area
- Buildable Area
- Optioned Properties
- Existing Features**
- Road
- Railway
- Contour Line (5 meter intervals)
- Property Line
- Building
- Waterbody (as per MNR base mapping)
- Watercourse (as per MNR base mapping)
- Setbacks**
- Road Setback- Blade Tips Plus 10m (55.2m)
- Property Line Setback (100m)

Notes

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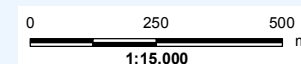
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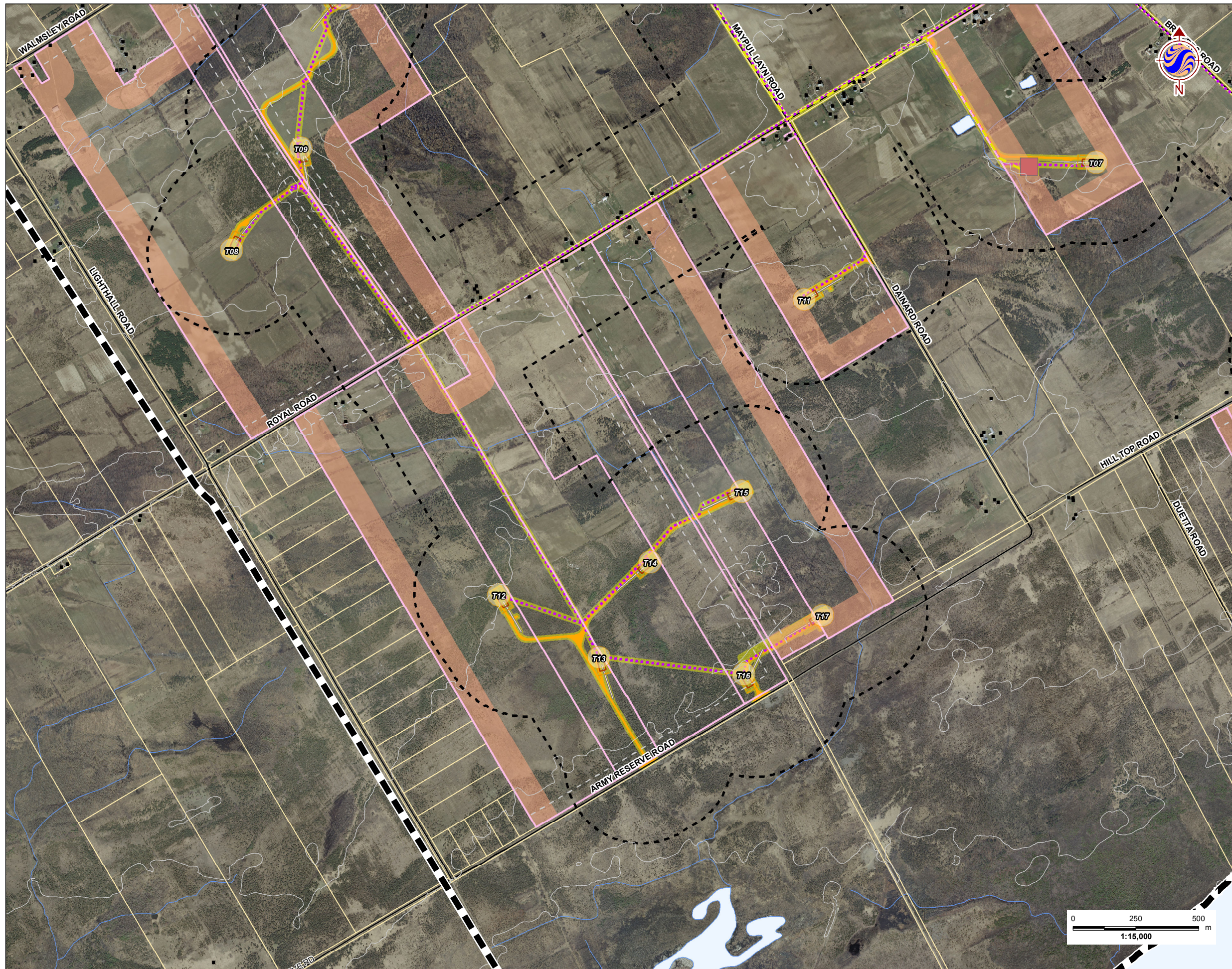
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2.3

Title

Project Location
Tile 3





Legend

- Study Area
- 300m Zone of Investigation
- Proposed Project Components**
- Wind Turbine (Blade Sweep)
- Access Road
- Collector Line
- Interconnection Line
- Construction Area
- Turbine Laydown Area
- Crane Laydown Area
- Substation
- Storage Area
- Buildable Area
- Optioned Properties
- Existing Features**
- Road
- Railway
- Contour Line (5 meter intervals)
- Property Line
- Building
- Waterbody (as per MNR base mapping)
- Watercourse (as per MNR base mapping)
- Setbacks**
- Road Setback- Blade Tips Plus 10m (55.2m)
- Property Line Setback (100m)

Notes

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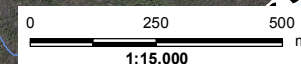
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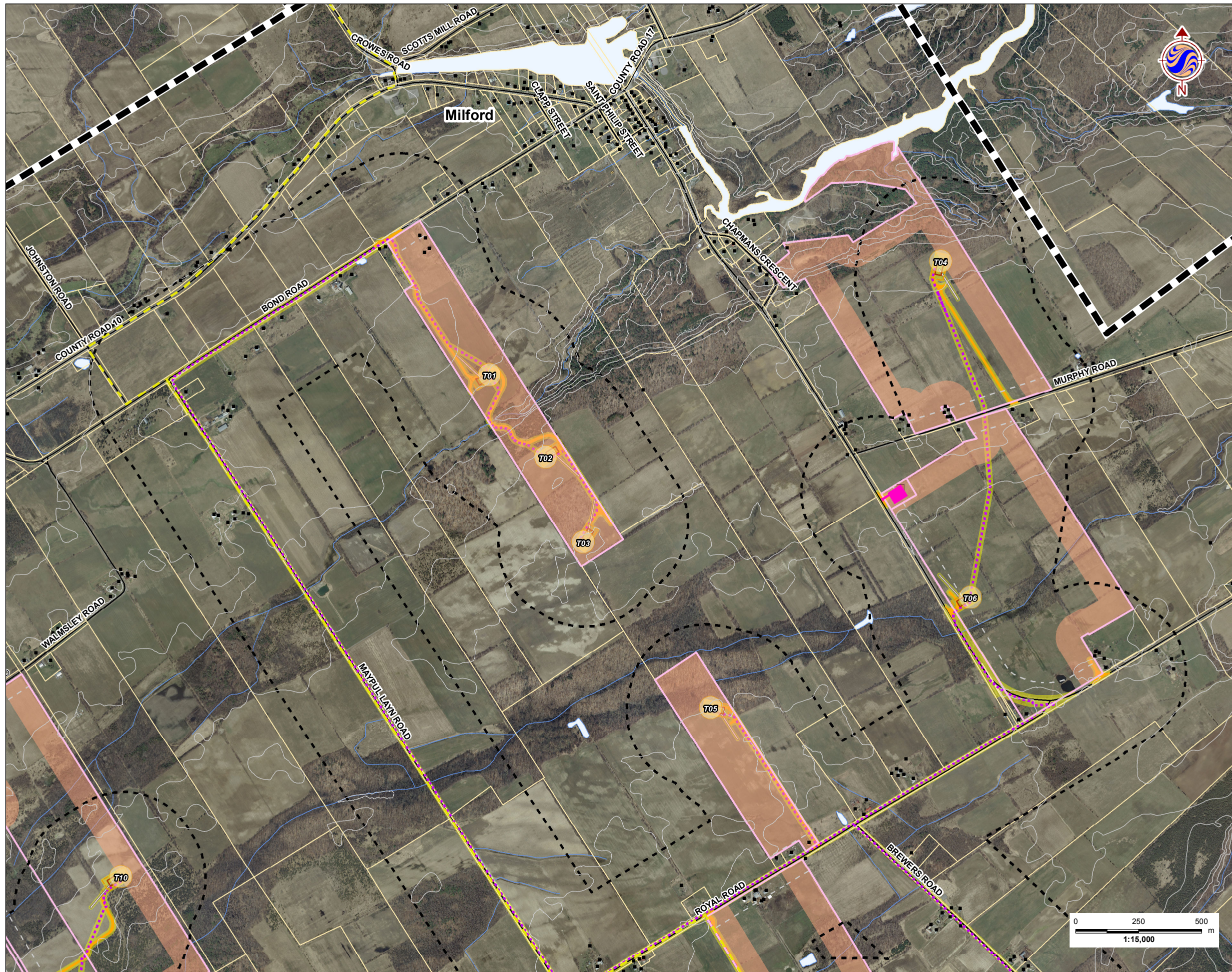
Figure No.

2.4

Title

Project Location
Tile 4





Legend

- Study Area
- 300m Zone of Investigation
- Proposed Project Components**
- Wind Turbine (Blade Sweep)
- Access Road
- Collector Line
- Interconnection Line
- Construction Area
- Turbine Laydown Area
- Crane Laydown Area
- Substation
- Storage Area
- Buildable Area
- Optioned Properties
- Existing Features**
- Road
- Railway
- Contour Line (5 meter intervals)
- Property Line
- Building
- Waterbody (as per MNR base mapping)
- Watercourse (as per MNR base mapping)
- Setbacks**
- Road Setback- Blade Tips Plus 10m (55.2m)
- Property Line Setback (100m)

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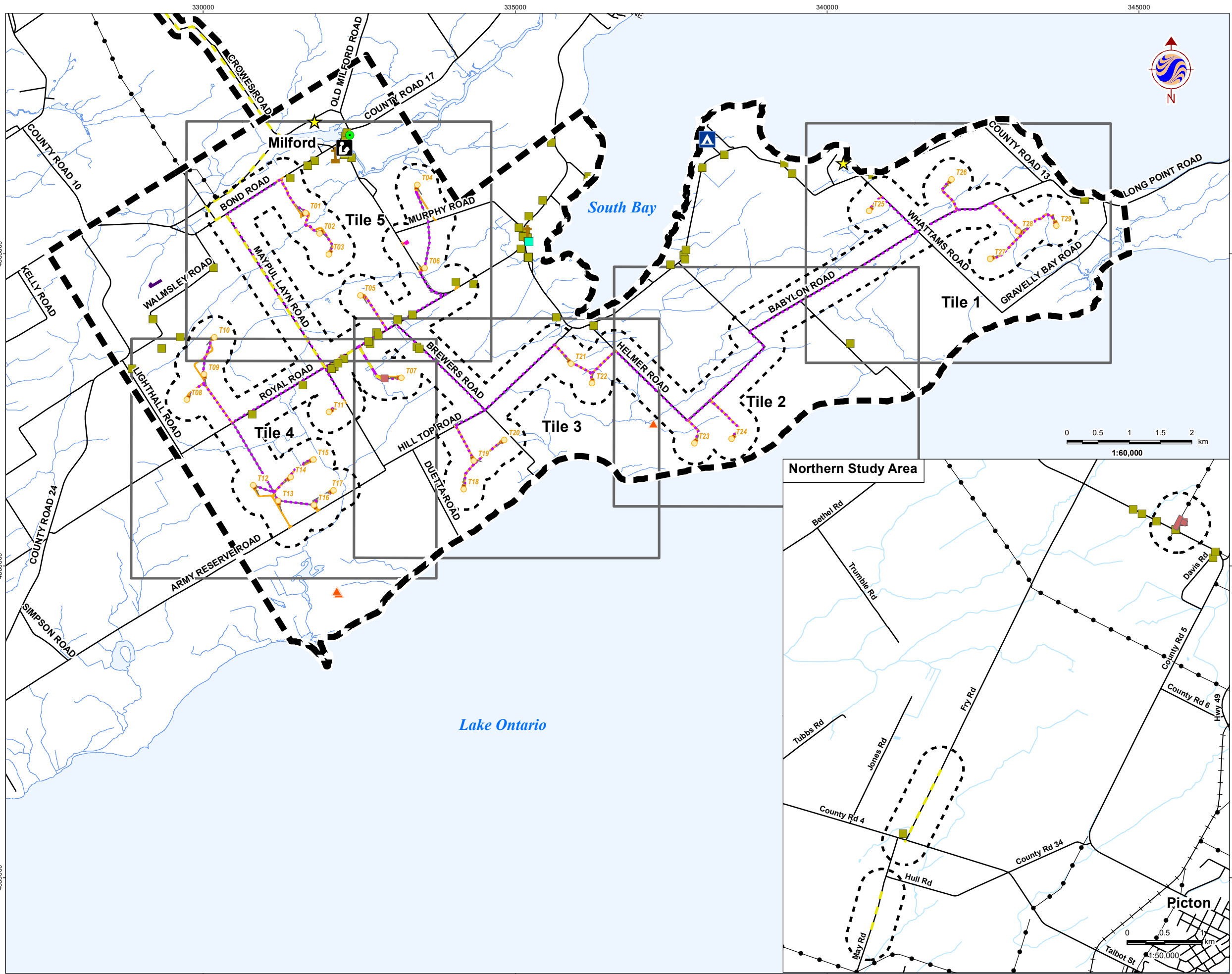
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Figure No.
2.5

Title
Project Location
Tile 5



Legend

- Study Area**
 - Study Area
 - 300m Zone of Investigation
- Proposed Project Components**
 - Wind Turbine (Blade Sweep)
 - Access Road
 - Collector Line
 - Interconnection Line
 - Construction Area
 - Turbine Laydown Area
 - Crane Laydown Area
 - Substation
 - Storage Area
- Existing Features**
 - Road
 - Railway
 - Transmission Line
 - Petroleum Well (Abandoned)
 - Conservation Area
 - Church
 - Fairgrounds
 - Library
 - Museum
 - RV Park
 - Heritage and Protected Properties
 - Contaminated Site
 - Waterbody (as per MNR base mapping)
 - Watercourse (as per MNR base mapping)

Notes

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WHITE PINES WIND PROJECT

Figure No.
3.0

Title
Socio-Economic Features



Legend

- Study Area
- 300m Zone of Investigation
- Proposed Project Components**
 - Wind Turbine (Blade Sweep)
 - Access Road
 - Collector Line
 - Interconnection Line
 - Construction Area
 - Turbine Laydown Area
 - Crane Laydown Area
 - Substation
 - Storage Area
- Existing Features**
 - Road
 - Railway
 - Transmission Line
 - Building
 - Petroleum Well (Abandoned)
 - Conservation Area
 - Water Well Records (MOE)
 - Church
 - Fairgrounds
 - Library
 - RV Park
 - Heritage and Protected Properties
 - Waterbody (as per MNR base mapping)
 - Watercourse (as per MNR base mapping)

- ### Notes
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Figure No.
3.1

Title
**Socio-Economic
Features
Tile 1**



Legend

- Study Area
- 300m Zone of Investigation
- Proposed Project Components**
 - Wind Turbine (Blade Sweep)
 - Access Road
 - Collector Line
 - Interconnection Line
 - Construction Area
 - Turbine Laydown Area
 - Crane Laydown Area
 - Substation
 - Storage Area
- Existing Features**
 - Road
 - Railway
 - Transmission Line
 - Building
 - Petroleum Well (Abandoned)
 - Conservation Area
 - Water Well Records (MOE)
 - Church
 - Fairgrounds
 - Library
 - RV Park
 - Heritage and Protected Properties
 - Waterbody (as per MNR base mapping)
 - Watercourse (as per MNR base mapping)

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
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3. Imagery Source: © First Base Solutions, 2012
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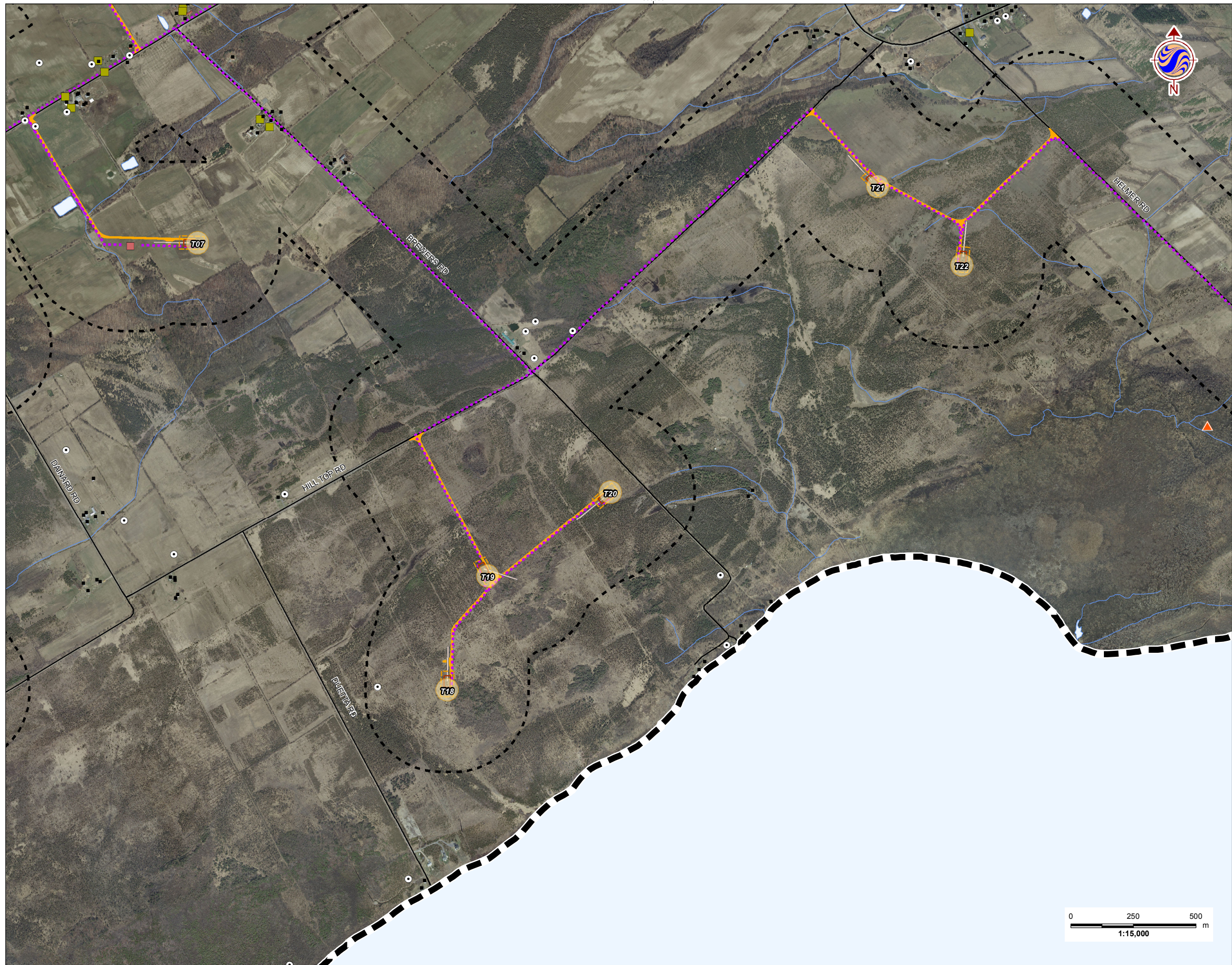


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WPD CANADA CORP.
WHITE PINES WIND PROJECT

Figure No.
3.2

Title
**Socio-Economic
Features
Tile 2**



Legend

- Study Area
- 300m Zone of Investigation
- Proposed Project Components**
- Wind Turbine (Blade Sweep)
- Access Road
- Collector Line
- Interconnection Line
- Construction Area
- Turbine Laydown Area
- Crane Laydown Area
- Substation
- Storage Area
- Existing Features**
- Road
- Railway
- Transmission Line
- Building
- Petroleum Well (Abandoned)
- Conservation Area
- Water Well Records (MOE)
- Church
- Fairgrounds
- Library
- RV Park
- Heritage and Protected Properties
- Waterbody (as per MNR base mapping)
- Watercourse (as per MNR base mapping)

Notes

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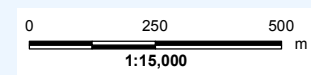
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WHITE PINES WIND PROJECT

Figure No.

3.3

Title

**Socio-Economic
Features**
Tile 3





- ### Legend
- Study Area
 - 300m Zone of Investigation
 - Proposed Project Components**
 - Wind Turbine (Blade Sweep)
 - Access Road
 - Collector Line
 - Interconnection Line
 - Construction Area
 - Turbine Laydown Area
 - Crane Laydown Area
 - Substation
 - Storage Area
 - Existing Features**
 - Road
 - Railway
 - Transmission Line
 - Building
 - Petroleum Well (Abandoned)
 - Conservation Area
 - Water Well Records (MOE)
 - Church
 - Fairgrounds
 - Library
 - RV Park
 - Heritage and Protected Properties
 - Waterbody (as per MNR base mapping)
 - Watercourse (as per MNR base mapping)

- ### Notes
1. Coordinate System: UTM NAD 83 - Zone 18 (N).
 2. Data Sources: Ontario Ministry of Natural Resources © Queens Printer Ontario, 2011; © Natural Resources Canada, 2011; © WPD Canada, 2011; © Prince Edward County, 2011.
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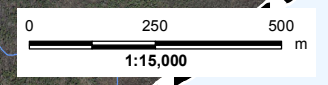
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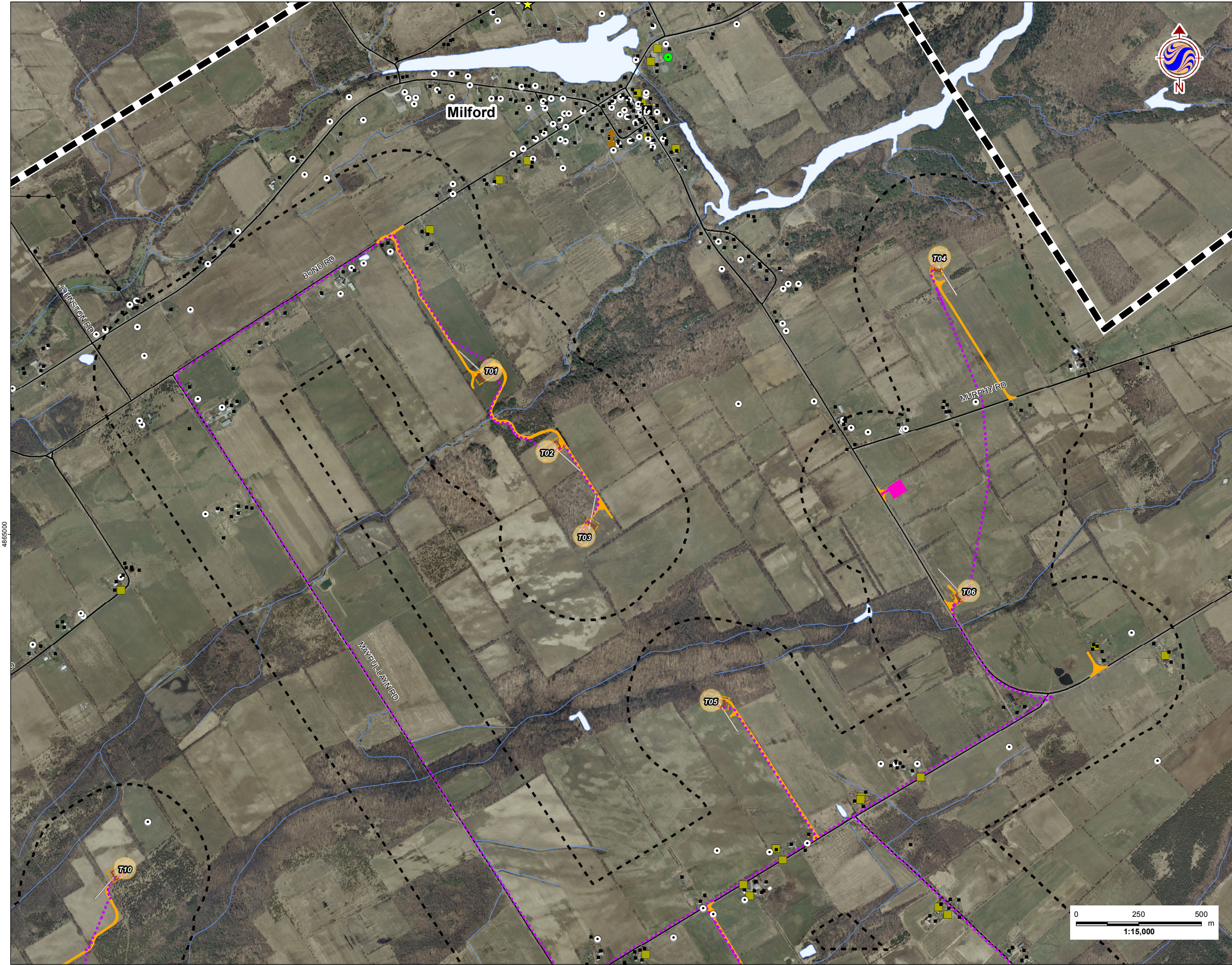
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WHITE PINES WIND PROJECT

Figure No.
3.4

Title
**Socio-Economic
Features**
Tile 4

4860000





Legend

- Study Area
- 300m Zone of Investigation
- Proposed Project Components**
- Wind Turbine (Blade Sweep)
- Access Road
- Collector Line
- Interconnection Line
- Construction Area
- Turbine Laydown Area
- Crane Laydown Area
- Substation
- Storage Area
- Existing Features**
- Road
- Railway
- Transmission Line
- Building
- Petroleum Well (Abandoned)
- Conservation Area
- Water Well Records (MOE)
- Church
- Fairgrounds
- Library
- RV Park
- Heritage and Protected Properties
- Waterbody (as per MNR base mapping)
- Watercourse (as per MNR base mapping)

Notes

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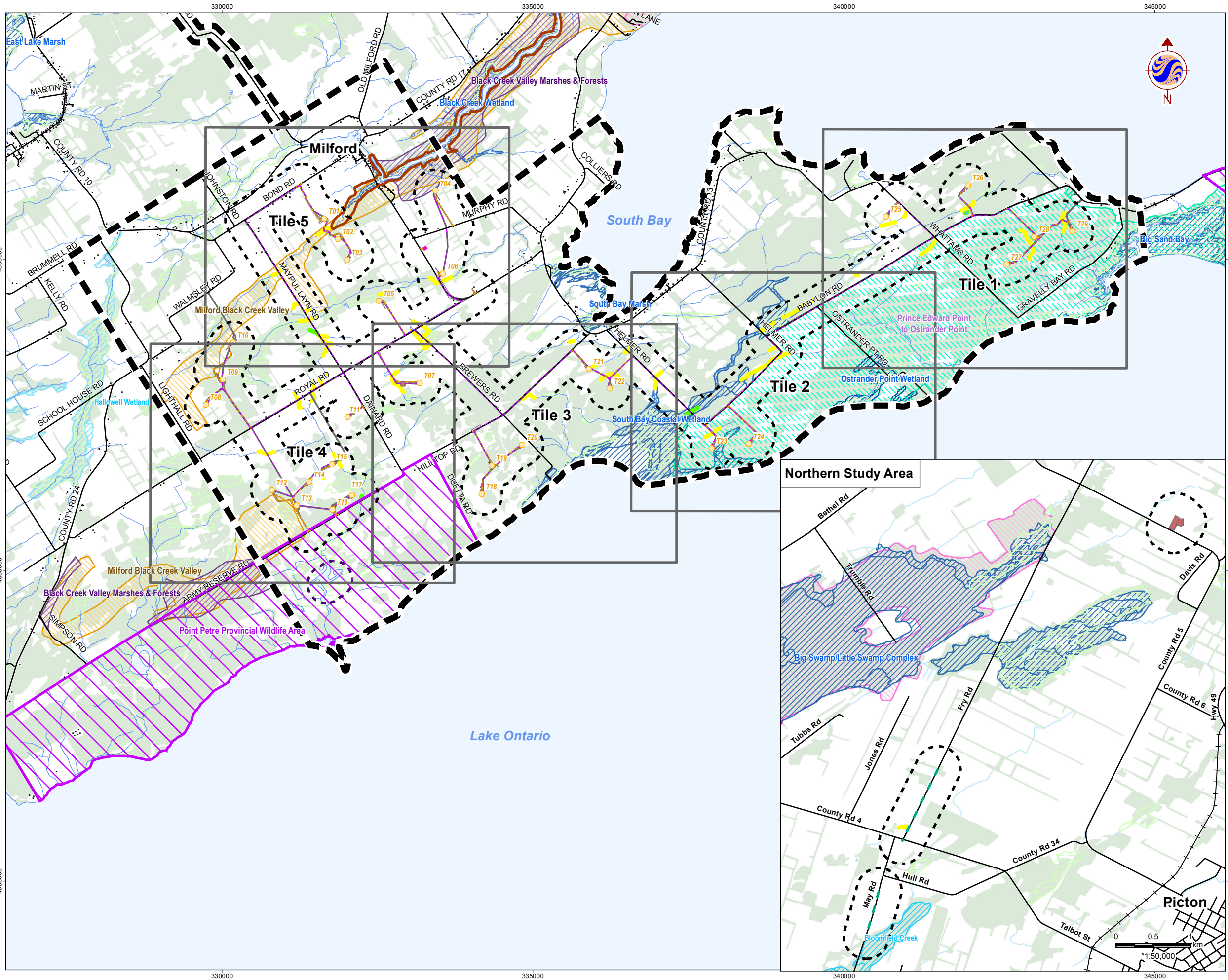
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WHITE PINES WIND PROJECT

Figure No.
3.5

Title
**Socio-Economic
Features
Tile 5**



Legend

- Study Area
- 300m Zone of Investigation
- Proposed Project Components**
- Wind Turbine (Blade Sweep)
- Access Road
- Collector Line
- Interconnection Line
- Substation
- Storage Area
- Existing Features**
- Highway / Expressway
- Road
- Railway
- Watercourse (as per MNR base mapping)
- Building
- Waterbody (as per MNR base mapping)
- Unevaluated Wetland
- REA Water Body
- Not a REA Water Body
- Natural Features- Records Review**
- Black Creek Valleyland
- Provincially Significant Wetland
- Non-Provincially Significant Wetland
- Wildlife Area
- Great Blue Heron Colony/
Osprey Nest 300m Buffer
- Area of Natural and Scientific Interest (ANSI)**
- Earth Science, Provincially Significant
- Earth Science, Regionally Significant
- Life Science, Provincially Significant
- Life Science, Regionally Significant
- Candidate Life Science, Provincially Significant

Notes

1. Coordinate System: UTM NAD 83 - Zone 18 (N).
2. Data Sources: Ontario Ministry of Natural Resources
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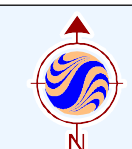
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WHITE PINES WIND PROJECT

Figure No.
4.0

Title
**Natural Heritage Features
and Water Bodies**



- Legend**
- 300m Zone of Investigation
 - Proposed Project Components**
 - Wind Turbine (Blade Sweep)
 - Access Road
 - - - Proposed Collector Line
 - ▭ Construction Area
 - ▭ Turbine Laydown Area
 - ▭ Crane Laydown Area
 - ▭ Substation
 - ▭ Storage Area
 - Existing Features**
 - Highway / Expressway
 - Road
 - +— Railway
 - Watercourse (as per MNR base mapping)
 - Waterbody (as per MNR base mapping)
 - Natural Features**
 - ▭ Wetland Feature (we)
 - ▭ Woodland Feature (wo)
 - Significant Wildlife Habitat**
 - ▭ Migratory Landbird Stopover Area (mlsa)
 - ▭ Alvar Features (al)
 - ▭ Amphibian Breeding Habitat (ah)
 - Species of Conservation Concern**
 - ▭ Shrub/ Successional Breeding Birds (ssbb)

- Notes**
1. Coordinate System: UTM NAD 83 - Zone 18 (N).
 2. Data Sources: Ontario Ministry of Natural Resources © Queens Printer Ontario, 2009; © Natural Resources Canada, 2009; © WPD Canada, 2010; © Prince Edward County, 2004.
 3. Image Sources: © First Base Solutions, 2011 - Imagery Date 2008.



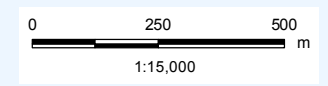
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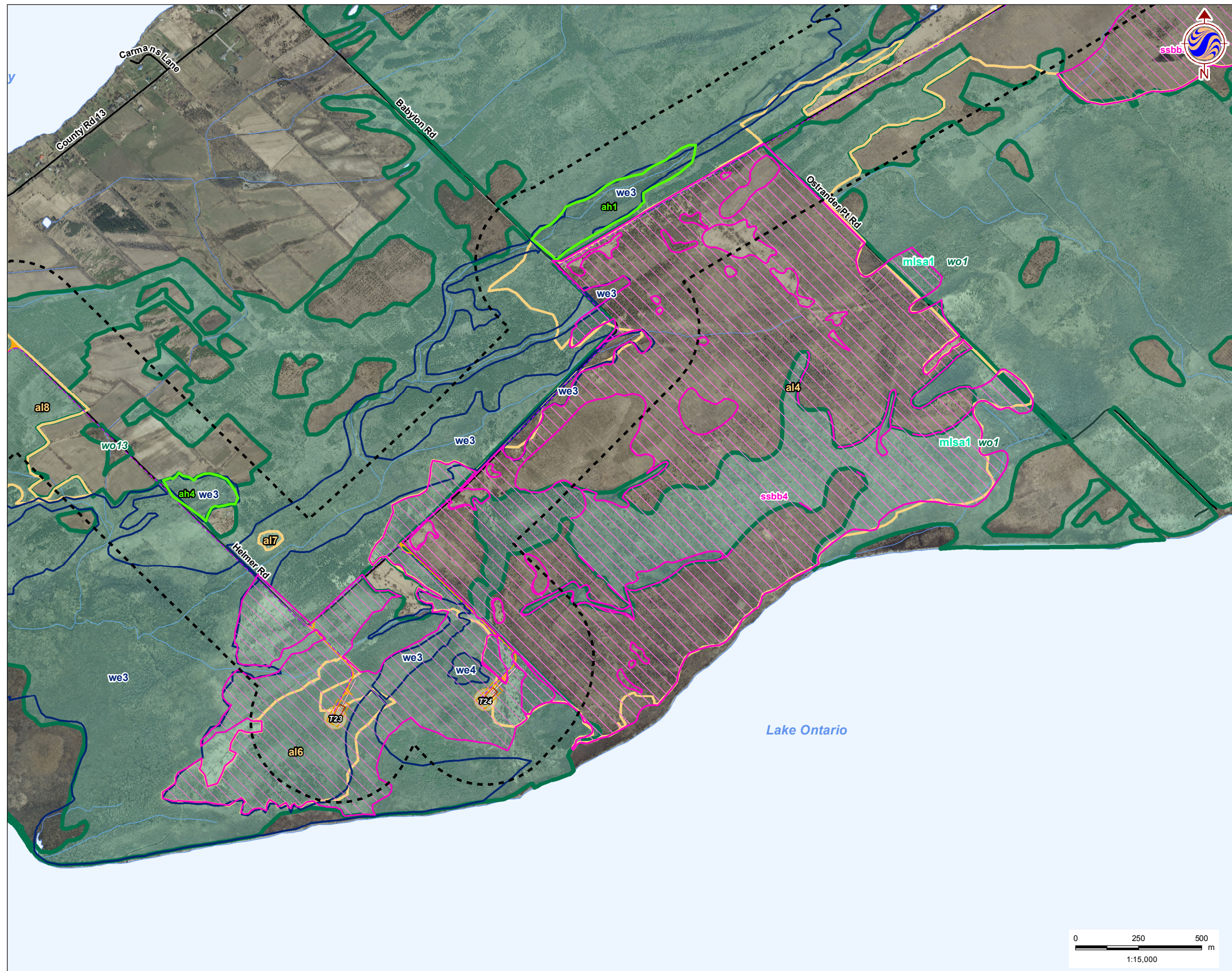
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WPD CANADA CORP.
WHITE PINES WIND PROJECT

Figure No.
4.1

Title
Natural Heritage Features
Tile 1 of 6





Legend

- 300m Zone of Investigation
- Proposed Project Components**
- Wind Turbine (Blade Sweep)
- Access Road
- - - Proposed Collector Line
- ▭ Construction Area
- ▭ Turbine Laydown Area
- ▭ Crane Laydown Area
- ▭ Substation
- ▭ Storage Area
- Existing Features**
- Highway / Expressway
- Road
- +— Railway
- Watercourse (as per MNR base mapping)
- ▭ Waterbody (as per MNR base mapping)
- Natural Features**
- ▭ Wetland Feature (we)
- ▭ Woodland Feature (wo)
- Significant Wildlife Habitat**
- ▭ Migratory Landbird Stopover Area (mlsa)
- ▭ Alvar Features (al)
- ▭ Amphibian Breeding Habitat (ah)
- Species of Conservation Concern**
- ▭ Shrub/ Successional Breeding Birds (ssbb)

Notes

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2. Data Sources: Ontario Ministry of Natural Resources
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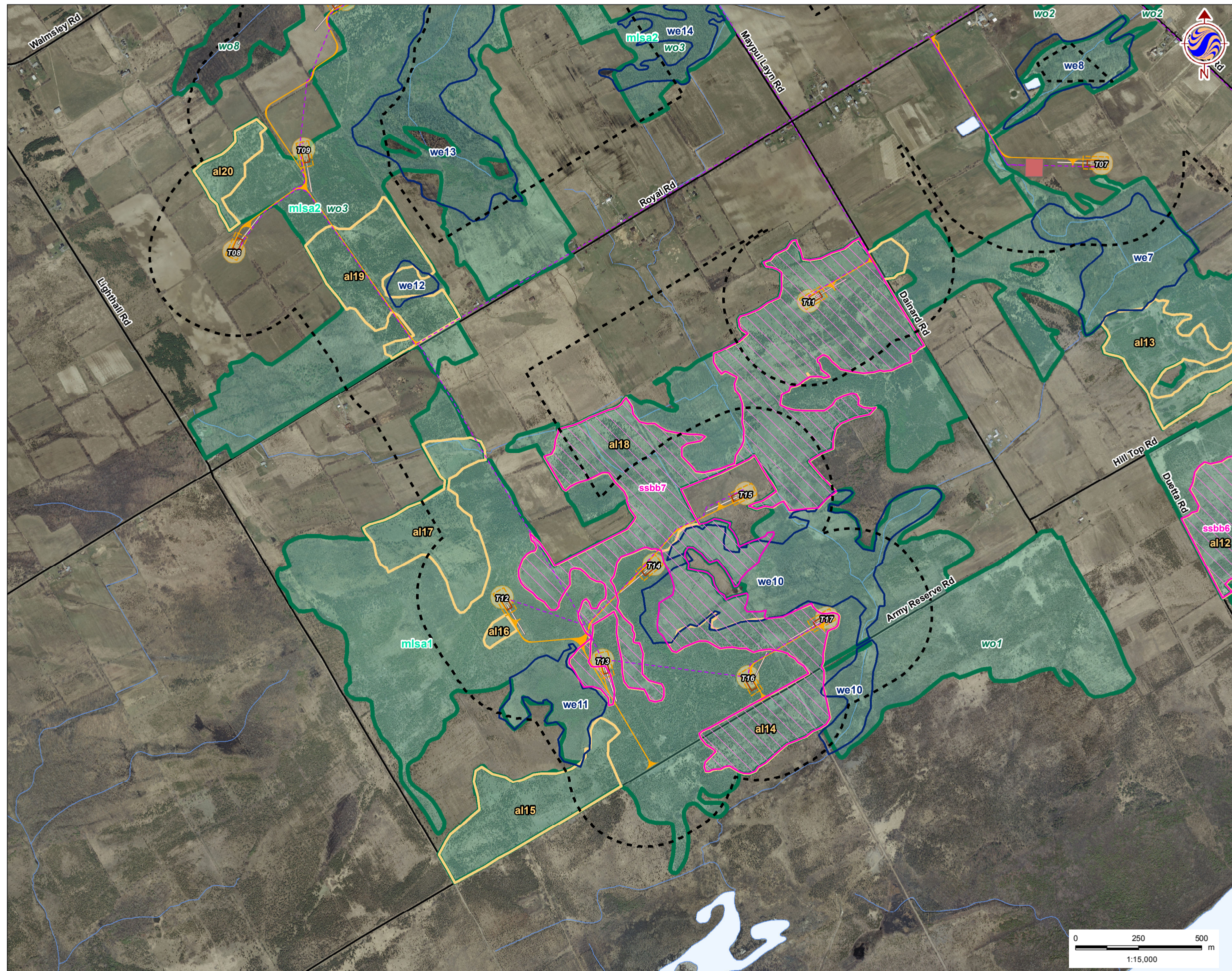
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WHITE PINES WIND PROJECT

Figure No.
4.2

Title
Natural Heritage Features
Tile 2 of 6



- ### Legend
- 300m Zone of Investigation
 - Proposed Project Components**
 - Wind Turbine (Blade Sweep)
 - Access Road
 - - - Proposed Collector Line
 - ▭ Construction Area
 - ▭ Turbine Laydown Area
 - ▭ Crane Laydown Area
 - ▭ Substation
 - ▭ Storage Area
 - Existing Features**
 - == Highway / Expressway
 - Road
 - ++ Railway
 - Watercourse (as per MNR base mapping)
 - ▭ Waterbody (as per MNR base mapping)
 - Natural Features**
 - ▭ Wetland Feature (we)
 - ▭ Woodland Feature (wo)
 - Significant Wildlife Habitat**
 - ▭ Migratory Landbird Stopover Area (mlsa)
 - ▭ Alvar Features (al)
 - ▭ Amphibian Breeding Habitat (ah)
 - Species of Conservation Concern**
 - ▭ Shrub/ Successional Breeding Birds (ssbb)

- ### Notes
1. Coordinate System: UTM NAD 83 - Zone 18 (N).
 2. Data Sources: Ontario Ministry of Natural Resources © Queens Printer Ontario, 2009; © Natural Resources Canada, 2009; © WPD Canada, 2010; © Prince Edward County, 2004.
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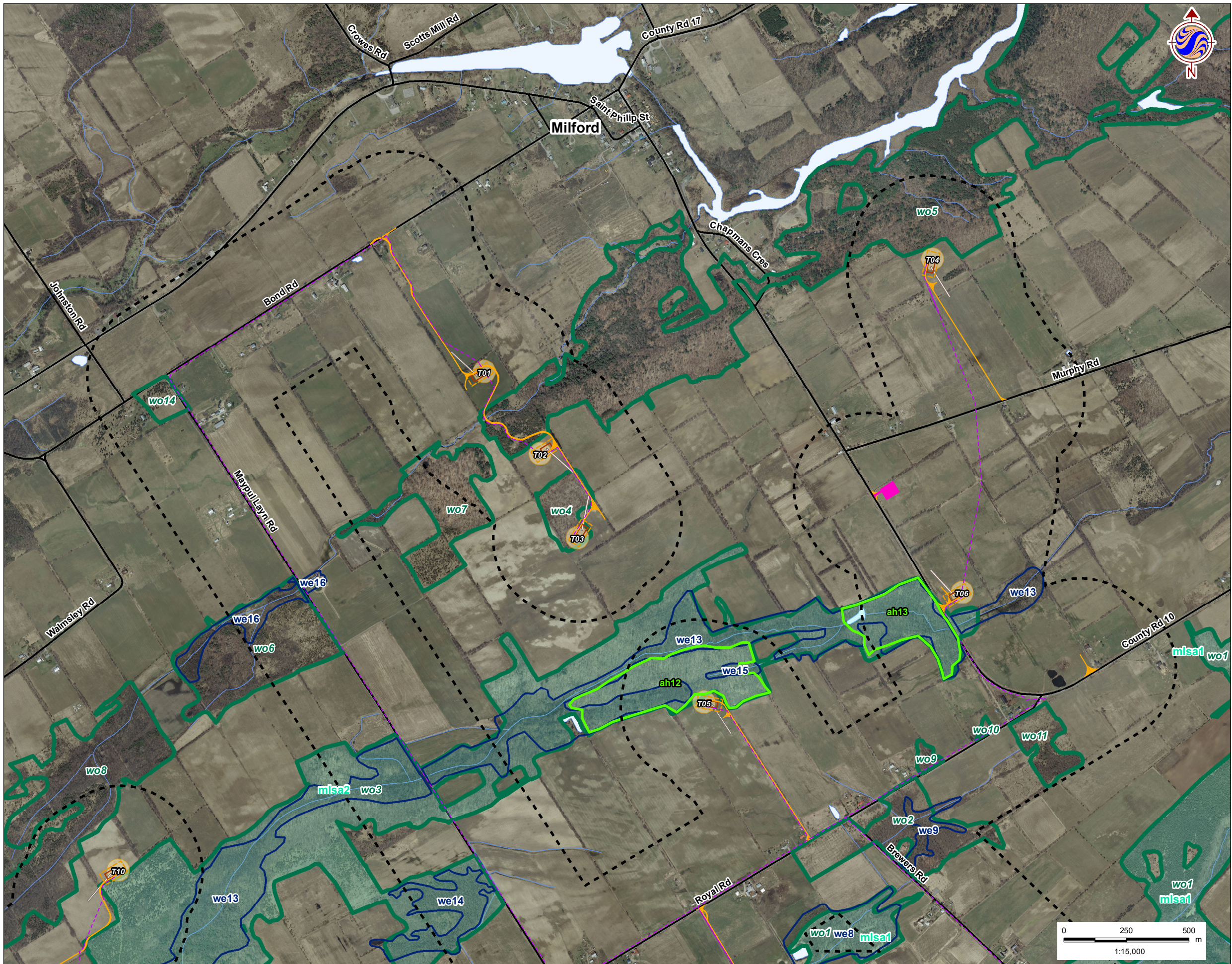
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WPD CANADA CORP.
WHITE PINES WIND PROJECT

Figure No.
4.4

Title
Natural Heritage Features
Tile 4 of 6



Legend

- 300m Zone of Investigation
- Proposed Project Components**
- Wind Turbine (Blade Sweep)
- Access Road
- Proposed Collector Line
- ▭ Construction Area
- ▭ Turbine Laydown Area
- ▭ Crane Laydown Area
- ▭ Substation
- ▭ Storage Area
- Existing Features**
- Highway / Expressway
- Road
- +— Railway
- Watercourse (as per MNR base mapping)
- ▭ Waterbody (as per MNR base mapping)
- Natural Features**
- ▭ Wetland Feature (we)
- ▭ Woodland Feature (wo)
- Significant Wildlife Habitat**
- ▭ Migratory Landbird Stopover Area (mlsa)
- ▭ Alvar Features (al)
- ▭ Amphibian Breeding Habitat (ah)
- Species of Conservation Concern**
- ▭ Shrub/ Successional Breeding Birds (ssbb)

Notes

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2. Data Sources: Ontario Ministry of Natural Resources Canada, 2009; © Natural Resources Canada, 2009; © WPD Canada, 2010; © Prince Edward County, 2004.
3. Image Sources: © First Base Solutions, 2011 - Imagery Date 2008.



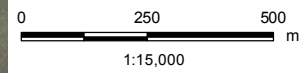
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WHITE PINES WIND PROJECT

Figure No.
4.5

Title
Natural Heritage Features
Tile 5 of 6



323400 323700 324000 324300 324600 324900

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 Revised: 2012-09-11 By: dharvey

4875000 4875300 4875600 4875900 4876200 4876500 4876800 4877100 4877400



Legend	
	120m Zone of Investigation
	Proposed Interconnection Line
	Buildable Area
	Road
	Watercourse
	Waterbody
Site Investigation: Natural Features	
	Woodland (Stantec)
	Generalized Wildlife Habitat (Stantec)
	Wetland (Stantec)

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 WPD CANADA CORP.
 WHITE PINES WIND PROJECT

Figure No.
 4.6

Title
Natural Heritage Features

September 2012
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