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ROMNEY
wind energy centre

ROMNEY WIND ENERGY CENTRE

Project Description Report

Romney Energy Centre Limited Partnership

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C	24 February 2017	Updated to include Environmental Effects Monitoring Plan	N. O'Neill	G. Constantin	M. Roberge

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List of abbreviations

Abbreviation	Meaning
ANSI	Life Science Area of Natural and Scientific Interest
APRD	Approval and Permitting Requirements Document
ARA	Archaeological Research Associates Ltd.
CEAA	*Canadian Environmental Assessment Act*
DFO	Department of Fisheries and Ocean Canada
DNV GL	GL Garrad Hassan Canada Inc.
EDF EN	Électricité de France Énergies Nouvelles
ESA	Endangered Species Act
EPA	Ontario *Environmental Protection Act*
Hydro One	Hydro One Network Inc.
IBA	Important Bird Areas
IESO	Independent Electricity System Operator
LTVCA	Lower Thames Valley Conservation Authority
MNRF	Ontario Ministry of Natural Resources and Forestry
MOECC	Ontario Ministry of Environment and Climate Change
MTCS	Ontario Ministry of Tourism, Culture and Sport
MTO	Ontario Ministry of Transportation
MW	Megawatt
NIA	Noise Impact Assessment
OEB	Ontario Energy Board
O&M	Operations and Maintenance
ON	Ontario
O. Reg	Ontario Regulation
PDR	Project Description Report
PSWs	Provincially Significant Wetlands
REA	Renewable Energy Approval
SCADA	Supervisory Control and Data Acquisition
SARA	*Species at Risk Act*
TC	Transport Canada
WTG	Wind Turbine Generator

1 PREAMBLE

Romney Energy Centre Limited Partnership (the "Proponent") is proposing to develop the Romney Wind Energy Centre (the "Project") which is subject to Ontario Regulation (O. Reg.) 359/09 (Renewable Energy Approvals (REA) [1] under Part V.0.1 of the Ontario Environmental Protection Act (EPA)), as amended. EDF EN was awarded a contract for this Project in March 2016 from the Independent Electricity System Operator (IESO) under the Large Renewable Procurement (LRP), and is seeking a Renewable Energy Approval (REA) from the Ontario Ministry of the Environment and Climate Change (MOECC). The Project will be owned and operated by Romney Energy Centre Limited Partnership, a partnership between EDF EN Canada and Amjiwnaang First Nation. The Municipality of Chatham-Kent has also been provided with an option to participate in the Project.

This Project with a total nameplate capacity of up to 60 megawatts (MW) is considered to be a Class 4 wind facility. A total of 18 wind turbine locations are being permitted for the Project.

This Draft Project Description Report (PDR) has been prepared in accordance with Table 1 of O. Reg *359/09* and the Technical Guide to Renewable Energy Approvals, Chapter 4: Guidance for preparing the Project Description Report [2]. Table 1-1 presents the corresponding section for each Project Description Report requirements.

Table 1-1: Project Description Report Requirements and Corresponding Sections

Requirement	Section
Any energy sources to be used to generate electricity at the renewable energy generation facility	Section 2.3
The facilities, equipment or technology that will be used to convert the renewable energy source or any other energy source to electricity	Section 3.1
The class of the renewable energy generation facility	Section 2.3
The activities that will be engaged in as part of the renewable energy project	Section 3.2
The name plate capacity of the renewable energy generation facility	Section 2.3
The ownership of the land on which the project location is to be situated	Section 3.4
Negative environmental effects that may result from engaging in the project	Section 4
An unbound, well-marked, legible and reproducible map that is an appropriate size to fit on a 215 millimetre by 280 millimetre page, showing the project location and the land within 300 metres of the project location	Section 3.3, Appendix A

2 GENERAL INFORMATION

2.1 Project Name and Project Proponent

The name of the project is Romney Wind Energy Centre (hereafter referred to as "the Project") and Romney Energy Centre Limited Partnership is the Project proponent.

2.2 Location of Project

The Romney Wind Energy Centre is located in southwestern Ontario, within the Town of Lakeshore and the Municipality of Chatham Kent, Ontario. More specifically, the Project is located south of Highway 401, extending along Richardson Side Road and Wheatley Road near the community of Wheatley, Ontario. It has a total Project study area of approximately 5,093 ha.

Project components will be mostly installed on privately-owned agricultural lots within this area. It is anticipated that the electrical collector lines will be partially located within public road allowances. The Project will connect to the existing 230 kV transmission line located within the Town of Lakeshore and close to Richardson Side Road. There is a short section of transmission line (less than 1 km) proposed for the Project to be built by Hydro One Networks Inc. (Hydro One) from the Point of Common Coupling (PCC) to the Point of Interconnect (POI).

The proposed Project study area is located on private and public lands; the geographic coordinates of the extreme points of the Project study area are provided in Table 2-1. Figure 2-1 presents the location of the general Project study area.

Table 2-1: Geographic Coordinates of Project Study Area

Site Location	Easting	Northing
North	378764	4678793
East	386458	4665518
West	376264	4669394
South	379094	4662491

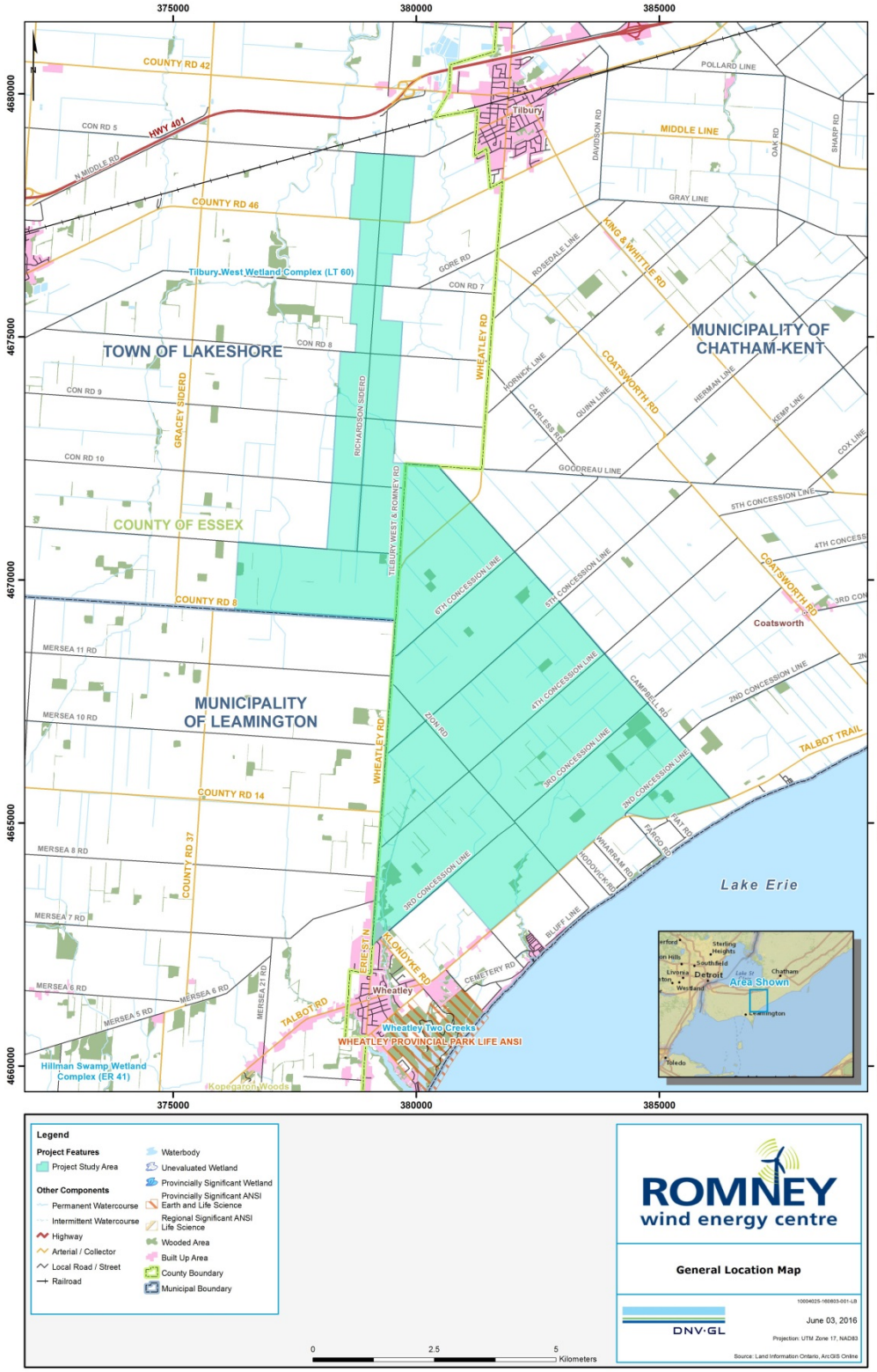

Figure 2-1: General Project Study Area

The location of the study area was defined early in the planning process for the proposed wind energy facility, based on the availability of wind resources, approximate area required for the proposed Project, and availability of existing infrastructure for connection to the electrical grid. Most of agricultural fields are planted annually with common crops (e.g. corn, soybeans and winter wheat) or are used as pasture lands. All turbines are to be installed in agricultural fields.

The Project Location, situated within the broader Project study area, is defined in O. Reg. 359/09 as "...*a part of land and all or part of any building or structure in, on or over which a person is engaging in or proposes to engage in the project and any air space in which a person is engaging in or proposes to engage in the projec*t". As described therein, the Project Location boundary is the outer limit of where site preparation and construction activities will occur (i.e., *Disturbance Areas* described below) and where permanent infrastructure will be located, including the air space occupied by turbine blades.

Disturbance Areas have been identified surrounding various Project components; such areas correspond to the "Project Location" boundaries in the map in Appendix A. These areas denote zones where temporary disturbance during the construction phase may occur as a result of: temporary Project component laydown and storage areas, crane pad construction or turbine turnaround areas. With the exception of the Project components described in section 3.1, no permanent infrastructure is proposed within these areas. Following construction activities, the land will be returned to pre-construction conditions.

Figure 2-2 through Figure 2-5 are representative of current agricultural land use in the Project study area.

Figure 2-2: Intersection of Lakeshore Road and Richardson Side Road

Figure 2-3: Zion Road North of Concession 5

Figure 2-4: Concession 3 west of Campbell Road

Figure 2-5: Zion Road south of Concession 4

2.3 Description of the Energy Source, Nameplate Capacity, and Class of Facility

The wind turbine generators (WTGs) of the Project will convert wind energy into electricity to feed into the Ontario IESO transmission system. This Project with a total nameplate capacity of up to 60 megawatts (MW) is considered to be a Class 4 wind facility. A total of 18 wind turbine locations are being permitted for the Project. The Proponent is currently evaluating different wind turbine technologies for the Project.

2.4 Contact Information

2.4.1 Project Proponent

The Project proponent is Romney Energy Centre Limited Partnership, a partnership between EDF EN Canada and Amjiwnaang First Nation. The primary contact for this Project is:

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Project email: RomneyWind@edf-en.ca
Project website: http://www.edf-en.ca/projects/project_display/romney-wind-energy-centre

2.4.2 Project Consultant

GL Garrad Hassan Canada Inc. (hereafter referred to as "DNV GL"), a member of the DNV GL Group and part of the DNV GL brand, has been retained to lead the REA for the Project. The Environmental and Permitting Services team of DNV GL has completed mandates throughout Canada, the United States and in many other parts of the world. These mandates include permitting management, permit applications, environmental impact assessment, and various environmental studies for more than 15,000 MW of wind and solar-PV projects.

DNV GL's environmental team is composed of over 20 environmental professionals, including environmental impact specialists, planners, GIS, technicians and engineers. DNV GL has no equity stake in any Project. This rule of operation is central to its philosophy, distinguishing it from many other players and underscoring its independence.

DNV GL's contact information is as follows:

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2.5 Other Approvals Required

The Project is subject to the provisions of the *Environmental Protection Act* and *O. Reg. 359/09*, as amended. The issuance of an approval by the MOECC will require approval by the Ministry of Natural Resources and Forestry (MNRF) and the Ministry of Tourism, Culture and Sport (MTCS).

In addition to the approvals required under *O. Reg. 359/09*, as amended, the Project will require additional approvals such as municipal building permits, as well as Lower Thames Valley Conservation Authority permits where potential disturbances to watercourses are anticipated. The Project may also require a permit under the *Endangered Species Act* (ESA), upon completion of an Approval and Permitting Requirements Document (APRD).

The Project may also require the following provincial or municipal authorizations:

- Encroachment Permits (Ministry of Transportation);
- Building Land Use Permit / Entrance Permits (Ministry of Transportation);
- Special Vehicle Configuration Permits (Ministry of Transportation);
- Oversize / Overweight Permits (Ministry of Transportation);
- Notice of Project (Ministry of Labor);
- Connection assessment and approvals (IESO);
- System impact assessment (IESO); and
- Leave to construct (Ontario Energy Board (OEB)); and
- Entrance permits, building permits, road use agreements, drainage permits (Municipality).

2.5.1 Federal Involvement

This Project is not expected to trigger the *Canadian Environmental Assessment Act* (CEAA), as no federal authority will be expected to provide a licence, permit, certificate or other regulatory authorization. The Project will however be required to obtain land use clearance from NAV CANADA and an aeronautical obstruction clearance from Transport Canada (TC) for obstruction marking and lighting.

If Project infrastructures cross navigable waters, approval from TC may be required. While unlikely for this Project, if the Department of Fisheries and Ocean Canada (DFO) determines that any project activities can potentially cause serious harm to fish or adversely impact any aquatic species at risk listed under the *Species at Risk Act* (SARA), or their critical habitat, the Proponent is required to apply for an authorization under the *Fisheries Act* and/or SARA.

3 PROJECT INFORMATION

3.1 Facility Components

The Project will be made up of the following main components:

- Wind turbine generators;
- Meteorological tower(s);
- Access roads and crane pads; and
- Electrical collector system, junction boxes substation and interconnect;
- Operation and maintenance building; and
- Laydown and storage areas (including temporary staging areas).

3.1.1 Wind Turbines

At the time of this report, the final wind turbine technology has not been selected; however, it is likely to be in 3MW+ range of turbine. For the purposes of reference the Vestas V136-3.45 MW turbines will be considered, some of which may need to be de-rated. The total installed capacity for the Project will be up to 60 MW. The proposed turbine will be a 3-bladed and horizontal-axis turbine.

The total rotor diameter of the V136 is 136 m, resulting in a swept area of 14,526m2. The turbine rotors and nacelles are mounted on top of 132 m tubular towers, although other heights are being evaluated, which are manufactured in sections from steel plate. A pad mounted transformer will also be located adjacent to or inside the wind turbine tower.

The complete technical specifications for the selected technology will be available in the Wind Turbine Specification Report. The acoustic emissions data, including the sound power level and frequency, will be provided in the Noise Impact Assessment (NIA) report. Both of these reports will be available as part of the complete REA package.

All turbines of the Project will meet TC requirements from an aviation safety and lighting perspective.

3.1.2 Permanent Meteorological Tower(s)

Wind speed, wind direction, temperature and humidity will be measured by means of meteorological tower(s) of up to 132 m in height. The tower(s) will remain on site for the duration of the Project for wind turbine performance testing; exact location(s) with be determined prior to issuing the final REA reports. The tower(s) will be of lattice or monopole type and will be constructed on a small concrete pad(s) and/or and supported by a number of guy wires (lattice tower only).

3.1.3 Access Roads

Transportation of machinery, turbine components, main transformer and other equipment will use existing municipal roads. New access roads will be constructed on private lands to provide access to the turbine sites during the construction phase and for maintenance activities during operation, including side clearance. Typically access roads will be constructed to be up to 12 m wide during construction. Areas adjacent to the access road within the larger 20 m disturbance area may be utilized during the construction phase in order to accommodate cranes, transportation equipment and other construction activities. After construction,

these roads may be reduced in size to approximately 5-6 m in width, to allow access to turbines and associated infrastructure for maintenance and repairs.

3.1.4 Electrical Collector Lines and Substation

3.1.4.1 Electrical Collector Lines

The electricity generated at each of the WTGs will be transported through 34.5 kV underground or overhead electrical collector lines to the Project's substation. Electrical collector lines will be sited adjacent to the turbine access roads, where feasible, and will follow public road allowances to reach the Project substation.

Junction boxes will also be installed below or above ground where more than one circuit must be connected together and will be located on either privately-owned agricultural lots or within public road allowances.

3.1.4.2 Substation

Measuring a total footprint of up to 2-3 ha, the electrical substation for the Project will be located on privately held lands through an "option to lease land" agreement. The substation will be comprised of the following components:

- Disconnect switch(es);
- Circuit breaker (s);
- Main power transformer (s);
- Metering and protection equipment;
- Station service transformer (s);
- Grounding grid (consistent with the Ontario Electrical Safety Code);
- Containment system;
- Oil / water separator;
- Revenue metering; and
- Control building including SCADA.

A secondary containment system will also be included to prevent soil contamination in the event of a leak from the main transformer. At the substation, the voltage level will be raised to 230 kV by the main power transformer The electricity will then be delivered to the PCC. A new high-voltage overhead transmission line is proposed to be built by either Hydro One or the Proponent, between the PCC and POI located on privately owned lands held under lease options less than 1 km from the Project substation. This line will be owned and operated by Hydro One. At the POI, the Project will connect to the existing 230 kV Hydro One transmission line C21J. Operations and Maintenance Building

3.1.5 Operations and Maintenance Building

It is anticipated that an Operations and Maintenance (O&M) building will constructed in the general vicinity of the Project substation or closer to the wind turbines for the purposes of monitoring the day-to-day operations of the Project and supporting maintenance efforts. The exact location will be determined prior to issuance of the final REA reports. A small parking lot will be constructed to accommodate staff vehicles.

Potable water will be supplied by a well or through the municipal water system and a septic bed will be constructed for the disposal of sewage. A septic bed will be constructed to the minimum size required for the size of the O&M building. It is the Project owner's responsibility to ensure proper maintenance of the septic

system. The O&M building, septic system, and water supply solution will be constructed in accordance with applicable municipal and provincial standards.

3.1.6 Construction Staging and Laydown Areas

A temporary construction staging area will be constructed on privately owned lands for the purposes of staging and storing equipment during the construction phase. Activities on this site will include material storage, equipment refuelling, construction offices, parking lot, temporary toilet facilities, rinsing and water facilities. The temporary staging area will have a total footprint of approximately 2 ha.

In addition, a temporary area of approximately 1 ha around each wind turbine will be established for the laydown and assembly of the wind turbine components. This temporary area will be restored following the construction phase to to a condition suitable to the landowner and local authorities.

3.1.7 Culvert Installations

To the extent possible, Project infrastructure will be sited to minimize the number of water crossings. The Water Assessment and Water Body Report, describes all water crossings and associated mitigation measures, as part of the complete REA package.

Where instream work is required (i.e. installation of culvert), timing windows and permitting requirements will be discussed with the Lower Thames Valley Conservation Authority (LTVCA) in advance of any work taking place.

3.2 Project Activities

A wind energy project consists of three main phases: (i) site preparation and construction, (ii) operations, and (iii) decommissioning. This section presents an overview of the activities of each phase. Additional information will be provided in the Design and Operations Report, Construction Plan Report and the Decommissioning Plan Report, that have been prepared as part of the REA Application.

3.2.1 Site Preparation and Construction Phase

The Site Preparation and Construction Phase includes all activities from initial work planning to testing of the wind energy project before commissioning. The Proponent will obtain all approval requirements, undertake sites surveys, conduct a geotechnical assessment, preliminary and detailed engineering and secure equipment procurement (wind turbines, substation) during the pre-construction period. The Proponent will continue to engage with First Nation and Aboriginal communities as well as local landowners, the surrounding community, federal, provincial and municipal authorities.

The following activities will be undertaken during the Site Preparation and Construction Phase:

- Mobilisation on site;
- Clearing and grubbing of vegetation within construction limits;
- Site grading;
- Preparation of the construction staging area;
- Construction of new private access roads or upgrading existing public roads, if necessary;
- Trenching and installation of electrical collector lines;

- Excavation and pouring of concrete turbine foundation;
- Construction of crane pads;
- Delivery of equipment (turbines, cables, substation) and vehicles;
- Wind turbine assembly and installation;
- Application of erosion mitigation measures;
- Construction of the substation;
- Construction of the O&M building;
- Installation of the permanent meteorological tower;
- Installation of the microware tower (if applicable);
- Clean-up and reclamation of agricultural lands; and
- Turbine commissioning.

More specific details about the Site Preparation and Construction phase will be provided in the Construction Plan Report, as part of the complete REA package.

3.2.2 Operations Phase

The Project will require full-time technical and administrative staff to maintain and operate the facility. The primary workers will be wind turbine technicians along with a site supervisor. The wind turbines will be operating and generating electricity when the wind speed is within the operating range for the turbine and there are no component malfunctions.

Each turbine has a comprehensive control system that monitors the subsystems within the turbine and the local meteorological conditions to determine whether the conditions are suitable for operation. If an event occurs which is considered to be outside the normal operating range of the turbine (such as low hydraulic pressures, unusual vibrations or high generator temperatures), the wind turbine will immediately take itself out of service and report the condition to the Operations Centre. A communication line connects each turbine to the Operations Centre which closely monitors and, as required, controls the operation of each turbine. The wind turbine system will be integrated with the electric interconnection Supervisory Control and Data Acquisition (SCADA) to ensure that the Project critical controls, alarms, and functions are properly coordinated for safe, secure, and reliable operation.

The following activities will be undertaken during the Operations Phase:

- Operation of wind turbines and substation;
- Routine turbine maintenance;
- Unplanned turbine maintenance;
- Conduct natural heritage and noise compliance surveys;
- Follow-up with any complaints from neighbors;
- Transportation of Project staff; and
- Meter calibrations.

More specific details about the Operations phase will be provided in the Design and Operations Report.

3.2.3 Decommissioning Phase

The anticipated life of the Project is estimated to be a minimum of 20 years as per the IESO power purchase agreement however modern wind turbines are very reliable and the major components are designed to operate for approximately 25 years. If the facility is to be decommissioned and the turbines are to be

removed at the end of its service life or during construction, the procedures will be similar to the construction phase, but in reverse sequence.

The procedures will include:

- Mobilisation on site;
- Preparation of temporary staging areas;
- Upgrading access roads to allow access to dismantling equipment;
- Dismantling or removal of Project components (wind turbines, substation, meteorological towers, microware towers and operation and maintenance building);
- Removal of wind turbine foundation: The top 1 m of the turbine foundations will be removed and replaced with clean fill and stockpiled topsoil. This will be contoured to allow cultivation in the case of agricultural lands.
- Underground electrical collector lines will be cut, the ends buried to 1 m below grade, and left in place;
- Overhead electrical lines and poles, if any, that are not shared with Hydro One will be removed and the holes will be filled with clean fill;
- Transportation of equipment and material: all materials will be recycled, where possible, or disposed off site at an approved and appropriate facility; and
- Reclamation of agricultural lands (conditional to approval from landowner).

More specific details on the Decommissioning Phase will be provided in the Decommissioning Plan Report, as part of the complete REA application package.

3.2.4 Hazardous Waste Disposal, Sewage and Stormwater Management and Water-Taking Activities

All hazardous material will be treated using best practices. Hazardous material including fuel, oils, and grease may not be stored on site, but off site in a designated safe storage area. Disposal of hazardous wastes will only be required in the event of an accidental spill. The effect of accidental spills will be minimized by ensuring that relevant industry regulations are followed including (i) refueling construction equipment only at crane pads or designated areas, (ii) storing hazardous materials off site at designated safe storage areas, and (iii) maintaining emergency spill kits on the Project site.

The final decision on waste disposal or recycling will be the responsibility of the on-site contractor who will refer to the *Environmental Protection Act* before submitting a Generator Registration Report for each waste type produced at the facility.

Stormwater management will be practiced through the implementation of erosion and runoff prevention measures during the construction and decommissioning phases, where necessary. A conceptual Stormwater, Erosion and Sediment Management Plan has also been prepared for the Project.

Water takings, if required, will be conducted as proposed by the Water Body and Water Assessment Reports, included as part of the complete REA application package.

3.3 Project Location Map

The map in Appendix A illustrates the Project study area and vicinity. The map identifies land uses and water bodies within a 300 m radius of the Project study area. Cultural and heritage features will be shown in the updated Project location map that will be included as part of the final REA application.

3.4 Land Ownership

Turbines and substation will be located entirely on private land and the Proponent currently holds an "option to lease land" agreement for the properties on which Project components are proposed. Public road allowances (rights-of-way) will be used in some cases for electrical collector lines. The Project is not located on Crown land.

A legal description of the land parcels will be provided in the final REA application.

4 ENVIRONMENTAL EFFECTS MONITORING PLAN

This section presents a summary of potential effects, mitigation measures and residual effects associated with project-environment interactions during the construction, decommissioning and operations phase of the Project. For the sake of completeness, construction and decommissioning phase effects are discussed and presented here, but can also be found in the Construction and Decommissioning Plan Reports.

More detailed discussions relating to natural heritage impacts, archaeological and heritage impacts, noise impacts, land use impacts and water body impacts are found in the NHA reports, Archaeological Assessment Reports, Heritage Report, NIA and Water Body Reports, part of the complete REA application package.

4.1 Methodological Approach

As requested under REA, potential effects from the construction, installation, decommissioning and operation and of the wind farm have to be assessed while considering applicable mitigation and compensation measures. In order to assess *residual* effects from a Project (i.e. after considering mitigation/compensation measures), GL GH uses the *residual effects* definition from the Canadian Environmental Assessment Agency. A residual effect "level" and "significance" is then applied, as per Table 4-1 below.

Table 4-1: Levels of Residual Effects and Significance of Effect

Residual Effect	Level of Concern	Residual Effect Significance
Potential impact could threaten sustainability of the resource and should be considered a management concern. Research, monitoring and/or recovery initiatives should be considered.	High	Significant
Potential impact could result in a decline in resource to lower-than-baseline but stable levels in the study area after Project closure and into the foreseeable future. Regional management actions such as research, monitoring and/or recovery initiatives may be required.	Medium	Significant
Potential impact may result in a slight decline in resource in study area during the life of the Project. Research, monitoring and/or recovery initiatives would not normally be required.	Low	Not Significant
Potential impact may result in a slight decline in resource in study area during construction phase, but the resource should return to baseline levels.	Minimal	Not Significant

Depending on the outcome of the effects assessment, follow-up and/or monitoring programs could be proposed in order to further investigate the potential effects, or verify the significance of the effect following commissioning.

4.1.1 Construction and Decommissioning

Table 4-2: Potential Negative Effects and Mitigation Measures – Construction and Decommissioning

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
Cultural Heritage (Protected Properties, Archaeological and Heritage Resources)				
Disturbance or displacement of archaeological resources by any ground disturbance activity.	Avoid disturbance/loss of archaeological sites.	Conduct Archaeological Assessment and apply recommended avoidance measures and other measures from licensed archaeologist or MTCS to project design. Details of the Archaeological Assessment can be found in the reports on this subject as part of the complete REA application package.	The Archaeological Assessment was undertaken as per MTCS guidelines and it is anticipated that the Project will received confirmation from the MTCS. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Immediate notification of the Archaeologist and the MTCS In the event archaeological resources are found. Contingency: The magnitude of the residual effect is considered non-significant therefore no contingency is required provided the recommended mitigation measures and best management practices are applied.
Construction vibrations to sensitive cultural heritage buildings	Minimize direct impacts from vibrations.	Apply avoidance and minimization measures recommended in the Cultural Heritage Assessment. Details of the Cultural Heritage Assessment can be found in the reports on this subject as part of the complete REA application package.	The Cultural Heritage Assessment was undertaken as per MTCS guidelines and it is anticipated that the Project will received confirmation from the MTCS. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: No monitoring required. Contingency: If the avoidance and minimization measures cannot be implemented, a more detailed vibration analysis will be undertaken by a qualified engineer.
Natural Heritage				
Direct vegetation removal – Significant woodlands, wetlands and generalized Significant Wildlife Habitat	Minimize direct impacts on significant vegetation communities.	Clearly delineate work area using erosion fencing or other suitable barriers to correspond to the disturbance area limits to avoid accidental damage or	The NHA was undertaken per MNRF guidelines and this Project is	Monitoring: Undertake regular monitoring of the dripline where applicable to ensure

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
(SWH).		removal of retained species. The environmental monitor may also consider substituting other demarcating types for fencing, such as staking and flagging, where it is determined that there is no apparent risk to significant woodlands, SWHs, or Generalized SWHs. This could include instances where the significant features are at a higher elevation than the occurring construction activity. The environmental monitor will be a contractor with experience providing environmental recommendations on a large-scale construction site. Place the erosion fencing, or other barrier, as far away as possible from the feature or SWH, and no closer than the dripline where applicable. Locate all directional drill entry and exit pits a sufficient distance from the edge of significant natural features, SWHs, and Generalized SWHs, to maintain a vertical depth of at least 1.5 m at all times below the natural feature to protect the critical root zone where applicable. Details of the NHA can be found in the reports on this subject as part of the complete REA	anticipated to receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	the work area is clearly delineated and dripline boundaries are respected when construction is anticipated to occur within 10-30 m of significant woodlands, SWHs, or Generalized SWHs. This monitoring should occur at a minimum frequency of once per month. Contingency: Prune any tree limbs or roots that are accidentally damaged by construction activities using proper arboricultural techniques. Accidental damage to trees, or unexpected vegetation removal, may require re-planting of similar, native species, depending on the extent of damage incurred.
Disturbance of local wildlife- Bird Species of Conservation Concern, Colonially-Nesting Breeding Bird Habitat and Generalized SWHs.	Avoid direct impacts on breeding birds and their habitats. Minimize impacts on species that are relatively inactive at night and not accustomed to nighttime disturbances.	Avoid construction and decommissioning activities during the breeding bird period (May 1st – July 31st), wherever possible, to minimize potential disturbance to breeding birds. Schedule construction and decommissioning activities to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife, wherever possible. Details of the NHA can be found in the	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-	Monitoring: If construction or decommissioning activities must occur during the breeding bird period (May 1st – July 31st), a biologist will conduct nest searches in areas where natural vegetation will be removed. If an active bird nest is identified in the location where natural vegetation clearing is proposed, the area will be protected and no construction activities will occur until the young

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		reports on this subject as part of the complete REA application package.	significant.	have fledged or until the nest is no longer active, as confirmed by a qualified biologist. Contingency: If construction or decommissioning activities must occur outside of daylight hours, spotlights will be directed downward and/or away from the features to limit potential light disturbance to breeding birds. The magnitude of the residual effect is considered non-significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures and best management practices are applied.
Disturbance of local wildlife- Landbird Migratory Stopover Area.	Avoid direct impacts to migratory landbirds.	Schedule construction and decommissioning activities during the spring and fall landbird migratory stopover period (March 1st – May 31st and August 1st – October 31st) to occur during daylight hours to avoid disruptions to migratory behavior, wherever possible.	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures. Contingency: If construction and decommissioning activities must occur outside of daylight hours, spotlights will be directed downwards and/or away from the woodland to minimize potential impacts to migratory landbirds.
Disturbance of local wildlife- Bald Eagle Habitat.	Avoid direct impacts to Bald Eagle Habitat.	Project layout has been developed so that the Project Location occurs at least 400 m from the bald eagle nest location, and outside of both the primary and secondary habitat zones. No overhead lines, poles or turbines will	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive approval	Monitoring: During construction and decommissioning, monitoring of the eagle nest will follow the methods implemented during the evaluation of significance phase of the Project

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		be located within the tertiary zone (as determined by site-specific surveys). Project infrastructure will be placed within the Project Location and preferentially located furthest from the eagle nest, wherever possible. Avoid construction and decommissioning activities within the tertiary zone (as determined by site-specific surveys) from March 1st – May 15th.	from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	and will occur for the duration that construction and decommissioning activities occur within the tertiary zone (as determined by site-specific surveys). This will occur during the period of February 15th - August 15th, exclusive of March 1st - May 15th, when no construction will be permitted within the tertiary zone of the active nest. Contingency: If disturbance or avoidance behavior is observed during monitoring, the MNRF will be notified of appropriate contingency measures that will be implemented.
Disturbance of local wildlife- Bat Maternity Colony.	Avoid direct impacts to roosting bats.	Avoid construction and decommissioning activities during the critical roosting period (June 1st – June 30th).	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures. Contingency: The magnitude of the residual effect is considered non-significant therefore no contingency is required provided the recommended mitigation measures and best management practices are applied.
Minimization of Erosion and Sedimentation – Significant woodlands/wetlands, significant plant habitats, and Generalized SWHs.	Avoid contamination of Significant woodlands/wetlands, significant plant habitats, and Generalized SWHs.	The general contractor will develop and implement an Erosion and Sediment Control (ESC) plan that will be based off of the conceptual SESMP. Install, monitor, and maintain ESC measures (i.e. erosion fencing) around the Project Location for the duration of the construction or decommissioning activities, as identified within the ESC plan. Erect erosion fencing, or other barrier,	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-	Monitoring: Undertake regular monitoring and routine inspections to ensure proper installation of erosion control measures are in place. Monitor sediment and erosion control measures, such as erosion fencing, and check dams daily in areas where work is taking place and prior to and after any storm events.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		to correspond to the construction disturbance area limits. Place the erosion fencing, or other barrier, as far away as possible from the identified feature (s) and no closer than the dripline where applicable. Depending on site-specific conditions, such as steep topography and the presence of direct, or regular, surface water flow, the environmental monitor may consider substituting other styles of fencing, when appropriate. Store any stockpiled material more than 30 m from significant natural features, SWHs, and Generalized SWHs throughout the construction and decommissioning phases. Schedule grading to avoid times of high runoff volumes, wherever possible, and suspend work if an excessive sediment discharge occurs, as determined by an environmental monitor, until mitigation measures have been established. Re-vegetate areas adjacent to the feature(s) as soon as possible after construction activities are complete. Collect directional drill cuttings as they are generated and placed in a soil bin or bag for off-site disposal. Restore and re-vegetate directional drill entry/exit pits to pre-construction conditions as soon as possible after construction. Details of the NHA can be found in the reports on this subject as part of the complete REA application package.	significant.	Monitor sediment and erosion control measures weekly in areas where active construction is not occurring until the construction phase is complete. Contingency: If deficiencies in sediment and erosion control measures are noted, the environmental monitor will notify the general contractor and the Proponent and recommend remedial actions. If sedimentation and erosion control measures fail or/and degradation of the natural feature occurs, appropriate contingency measures will be implemented, which may include re-establishing mitigation measures, habitat remediation, and/or seeding of permanently damaged areas, depending on the extent of degradation incurred.
Reduced flood attenuation – Significant wetlands and vegetation communities.	Avoid impact on flood attenuation of significant wetlands and vegetation	Clearly delineate work area using erosion fencing, or other barrier, to minimize potential impacts to hydrological connectivity from loss of	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to	Monitoring: Undertake regular monitoring of the identified feature(s) to ensure the work area is clearly delineated for

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
	communities.	riparian vegetation. Depending on site-specific conditions, such as steep topography and the presence of direct, or regular, surface water flow, the environmental monitor may consider substituting other styles of fencing for erosion fencing, when appropriate. Where the temporary construction area is proposed to be within 5 m of, but not overlapping by a method other than directional drilling, a wetland (excluding along existing municipal roads), design any permanent infrastructure (i.e., access roads) to be 5 m from the wetland edge. Plant a native vegetation in the 5 m buffer between the infrastructure and wetland edge as soon as reasonably possible after construction. Re-vegetate cleared areas as soon as reasonably possible after construction activities are complete, to be initiated no later than 1 year after construction or decommissioning activities have been completed Details of the NHA can be found in the reports on this subject as part of the complete REA application package.	receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	the duration of the construction and decommissioning phases of the Project. This monitoring will be conducted at a minimum frequency of once per week when activities are occurring within 10 m of a feature. Undertake regular monitoring of the feature to ensure the work area is clearly delineated and respected when construction is anticipated to occur within 10-30 m of the features, at a minimum frequency of once per month. Depending on the season and site-specific conditions, such as topography, surface water flow patterns, and the presence or absence of vegetative buffers, monitoring frequency will be increased at the discretion of the environmental monitor. Contingency: The magnitude of the residual effect is considered non-significant therefore no contingency is required provided the recommended mitigation measures and best management practices are applied.
Minimization of Fugitive and Dust Emissions – Significant natural features, SWHs and generalized SWHs.	Avoid fugitive dust within significant natural features, SWHs, and Generalized SWHs.	On-site speed limits will be clearly posted, applied, and followed by construction staff. Apply dust suppressants to unpaved areas when necessary to suppress dust, as determined by the environmental monitor and general contractor. Application frequency will vary, but will be determined by site specific weather conditions, including recent precipitation, temperatures, and wind speeds. Input from the construction team may also warrant an increased	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Monitor dust control measures at a minimum frequency of weekly in areas where work is taking place. Monitor dust control measures at a minimum frequency of monthly in areas where active construction is not occurring until the construction phase is complete. Contingency: If fugitive dust is noted, the environmental monitor will notify the

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		frequency of dust suppression. Re-vegetate cleared areas as soon as reasonably possible after construction activities are complete, and initiated no later than 1 year after construction or decommissioning has been completed. Install wind fences, where determined to be necessary by the on-site environmental monitor. Installation of these fences will depend on site-specific conditions, including wind speeds, topography, land cover, and the extent of surrounding natural wind breaks.		general contractor and recommend remedial actions, if necessary. If fugitive dust control measures fail and degradation of the natural feature occurs, appropriate contingency measures will be implemented, which may include re-establishing mitigation measures, habitat remediation, and/or seeding of permanently damaged areas depending on the extent of degradation incurred.
Effects of groundwater discharge- Significant wetlands and Generalized SWHs.	Avoid direct impacts on significant wetlands and Generalized SWHs.	Monitor rate of water pumping and timing to meet requirement of less than 50,000 L per day per turbine location, and contact the local Ministry of the Environment and Climate Change (MOECC) if a total of more than 400,000 L per day situation arises. Restrict taking of groundwater and surface water during extreme low flow time periods. Control quantity and quality of stormwater discharge using best management practices, and avoid direct discharge into wetlands, SWHs, and Generalized SWHs		Monitoring: Undertake regular monitoring of significant wetlands and Generalized SWHs to ensure the work area is clearly delineated within 10 m of construction activities for the duration of the construction and decommissioning phases of the Project. This monitoring will be conducted at a minimum frequency of once per week when construction is anticipated within 10 m of a significant wetland or Generalized SWH. Undertake regular monitoring of significant wetlands and Generalized SWHs to ensure the work area is clearly delineated and respected when construction is anticipated to occur within 10-30 m of the features, at a minimum frequency of once per month. Depending on the season and site-specific conditions, such as topography, surface water flow patterns, and the presence or absence of vegetative buffers, monitoring frequency will be increased at the discretion of the environmental monitor.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
				Contingency: If impacts to significant wetlands and Generalized SWHs occur as a result of groundwater discharge, the MNRF will be notified of appropriate contingency measures that will be implemented.
Infiltration- Significant wetlands and Generalized SWHs.	Avoid impacts to infiltration.	Minimize the use of impervious surfaces where possible, such as utilizing and contouring permeable surface material (i.e. gravel) to increase infiltration, and reduce surface water runoff.	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures. Contingency: The magnitude of the residual effect is considered non-significant therefore no contingency is required provided the recommended mitigation measures and best management practices are applied.
Spills (i.e. oil, gasoline, grease, etc.) - Significant natural features, SWHs, and Generalized SWHs.	Avoid contamination of significant natural features.	The general contractor will develop a spill response plan and train staff on appropriate procedures. The general contractor will develop a 'frac-out' contingency plan and train staff on appropriate procedures during the construction phase. Keep emergency spill kits on site. Keep contact information for the MOECC Spills Action Centre in a designated area on-site. Dispose of waste material by authorized and approved off-site vendors. Store hazardous materials in designated areas. Locate all vehicle refueling or washing, as well as the storage of chemical and construction equipment more than 30 m	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Regular environmental monitoring will occur at least once every two weeks during the construction and decommissioning phase to ensure vehicle refueling and storage of chemicals is occurring more than 30 m from the applicable features. An environmental monitor will be present when active directional drilling is occurring within 30 m of significant natural features, SWHs, and Generalized SWHs. Contingency: If 'frac-out' occurs, immediately implement 'frac-out' contingency plan. In the event of a spill, notify the MOECC Spills Action Centre,

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		from applicable feature(s). Details of the NHA can be found in the reports on this subject as part of the complete REA application package.		immediately stop work, and ensure all efforts are made to completely remediate affected areas, especially prior to rain events. If a spill occurs within a significant natural feature, SWH, or Generalized SWH, the environmental monitor will be notified and a follow-up site inspection will be conducted to document extent of degradation of the features, if any. If degradation of significant natural features, SWHs, or Generalized SWHs occurs as a result of the spill, appropriate contingency measures will be implemented. Contingency measures may include re-establishing mitigation measures, habitat remediation, and/or seeding of permanently damaged areas depending on the extent of degradation incurred.
Changes in soil moisture and compaction - significant natural features, SWHs, and Generalized SWHs.	Minimize impact to soil moisture regime and vegetation species composition.	Minimize the use of impervious surfaces where possible, such as utilizing and contouring permeable surface material (i.e. gravel) to increase infiltration, and reduce surface water runoff. Minimize paved surfaces and design roads to promote infiltration. Details of the NHA can be found in the reports on this subject as part of the complete REA application package.	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures. Contingency: The magnitude of the residual effect is considered non-significant therefore no contingency is required provided the recommended mitigation measures and best management practices are applied.
Impacts to Water Quality - Significant wetlands.	Avoid impacts to water quality (i.e. associated with increased turbidity).	Clearly delineate work area using erosion fencing, or other barrier, to minimize potential impacts to water quality which may result from loss of riparian vegetation.	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive approval	Monitoring: Undertake regular monitoring of significant wetlands to ensure the work area is clearly delineated within 10 m of construction activities for

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		On site speed limits will be clearly posted, applied, and followed by construction staff. Apply dust suppressants to unpaved areas when necessary to suppress dust, as determined by the environmental monitor. Application frequency will vary, and will be determined by site specific weather conditions, including recent precipitation, temperatures, and wind speeds. Input from the general contractor may also warrant an increased frequency of dust suppression. Re-vegetate areas adjacent to significant wetlands as soon as possible after construction activities are complete, to be initiated no later than 1 year after the completion of construction or decommissioning activities. Install wind fences, where determined to be necessary by the on-site environmental monitor. Installation of these fences will depend on site-specific conditions, including wind speeds, topography, land cover, and the extent of surrounding natural wind breaks. No use of herbicides (Project related activities only) within significant wetlands. Details of the NHA can be found in the reports on this subject as part of the complete REA application.	from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	the duration of the construction and decommissioning phases of the Project. This monitoring will be conducted at a minimum frequency of once per week when construction is anticipated within 10 m of a significant wetland. Undertake regular monitoring of significant wetlands to ensure the work area is clearly delineated and respected when construction is anticipated to occur within 10-30 m of significant wetlands, at a minimum frequency of once per month. Depending on the season and site-specific conditions, such as topography, surface water flow patterns, and the presence or absence of vegetative buffers, monitoring frequency will be increased at the discretion of the environmental monitor. Contingency: If reduced water quality (i.e. increased turbidity) as a result of construction activities is observed, the MNRF will be notified of appropriate contingency measures that will be implemented.
Invasive Seed Transfer-Rare vegetation communities and plant species of conservation concern habitat.	To maintain vegetated buffers, including riparian zones. To avoid impacts of rare vegetation communities and plant species of conservation concern habitat.	Clearly delineate work area using erosion fencing, or other barrier, to minimize seed transfer into suitable habitat. Regularly clean vehicles and equipment. Vehicle use will occur primarily on access roads and in agricultural habitats, where invasive and non-native vegetation species are less likely to be	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive approval from the MNRF. The likelihood and magnitude of this residual effect is	Monitoring: Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures. Contingency: The magnitude of the residual effect is considered non-significant

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		concentrated. Details of the NHA can be found in the reports on this subject as part of the complete REA application.	considered non-significant.	therefore no contingency is required provided the recommended mitigation measures and best management practices are applied.
Soil compaction-Significant natural features, SHWs, and Generalized SWHs.	Avoid soil compaction.	Minimize vehicle traffic on exposed soils during site clearing, grubbing, grading and topsoil removal. Clearly delineate the dripline and root zone of all trees within 10 m of construction activities with erosion fencing or other barrier.	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures. Contingency: The magnitude of the residual effect is considered non-significant therefore no contingency is required provided the recommended mitigation measures and best management practices are applied.
Direct mortalities from traffic on access road.	Avoid direct mortalities due to traffic on access roads.	On-site speed limits will be clearly posted, applied, and followed by construction staff throughout the construction and decommissioning phases Details of the NHA can be found in the reports on this subject as part of the complete REA application.	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	The magnitude of the residual effect is considered non-significant therefore no monitoring or contingency is required provided the recommended mitigation measures and best management practices are applied.
Impacts to Species at Risk.	Limit impacts to Species at Risk.	The Project may require a permit under the ESA, upon completion of an Approval and Permitting Requirements Document (APRD). This report will be submitted to the local district MNRF to be reviewed under the authority of the *Ministry of Natural Resources Act*, and will not be submitted as part of this completed REA application.	NA	NA

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
Water Bodies				
Dewatering resulting in 1) Changes to surface water levels, or 2) Increased water temperature	Minimize impacts on stream flow water temperature. Minimize alteration of water level.	If water takings are required: Control rate and timing of water pumping so as not to result in erosion and sedimentation to receiving water bodies (see erosion and sedimentation, and water quality impairment).Pump from deep wells to infiltration galleries adjacent to water bodies or wetlands at a rate that reduces the potential for erosion (see erosion and sedimentation). Restrict taking of water during periods of extreme low flow and to avoid in-water work timing windows (generally March 15th to July 15th) as determined in consultation with the local MNRF Adequately treat any discharge water prior to discharge as to meet MOECC policy 2 standards (i.e. filer bags). Prior to groundwater dewatering, evaluate anticipated discharge rates and estimated ZOI in relation to the associated water bodies to ensure the volumes will not impact water body hydrologic function. Where a water body is located within a groundwater dewatering ZOI, develop appropriate strategies for dewatering in consultation with regulatory agencies during the detailed design phase of the project. Monitor water levels of water bodies within the ZOI to determine if dewatering activities are resulting in alteration of water levels within the water body. Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application.	The Water Body Assessment was undertaken as per MOECC guidelines and this Project is expected to receive confirmation from the MOECC. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Water level monitoring within water bodies will be conducted prior to the onset of construction at a frequency adequate to characterize baseline levels. During active dewatering, monitor water levels of water bodies within the ZOI for groundwater dewatering to determine if dewatering activities are resulting in alteration of water levels within the water body. Staff gauge readings are to be taken daily and water levels will be monitored by continuous level loggers (logged in 1 hour increments and downloaded weekly). Monitoring will be conducted post-construction until water levels return to baseline conditions. Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures. Contingency: The magnitude of the residual effect is considered non-significant therefore no contingency is required provided the recommended mitigation measures and best management practices are applied.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
Erosion and sedimentation.	Minimize impacts of erosion and sedimentation on water bodies.	Minimize potential for soil compaction (see Soil Compaction). Controlled vehicle and machinery access routes, keep away from water bodies where possible. Schedule clearing, grubbing and grading activities to avoid times of high runoff volumes e.g. snow melt or heavy rain events), wherever possible. Suspend work if an excessive sediment discharge occurs, as determined by an environmental monitor, until mitigation measures have been established. Implement Flood Response Plan if on-site flooding occurs. Implement Erosion and Sediment Control Plan (ESC). Avoid construction during high volume rain events (>20 mm in 24 hours) and significant snow melts/thaws where possible and resume once soils have stabilized to avoid risk of erosion, soil compaction or the potential for sediment release into nearby watercourses. Stabilize banks and cleared areas as soon as possible after construction disturbance (i.e. plantings, rock etc.) If insufficient time is available in the growing season to establish vegetative cover, an overwintering treatment such as erosion control blankets, fiber matting etc. could be applied to contain the site over the winter period. Maintain vegetation buffers around water bodies, where possible. Remove construction debris from the site and stabilize it (i.e. tarps) a minimum of 30 m away from water bodies to prevent it from entering the nearby water bodies.	The Water Body Assessment was undertaken as per MOECC guidelines and this Project is expected to receive confirmation from the MOECC. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: ESC measures, such as silt fence, check dams, and dust control measures, will be checked weekly during active construction periods, daily during extended rain or snowmelt periods, and prior to, during and after forecasted rain events (>20 mm in 24 hours) or significant snowmelt events. An environmental monitor will be present, as required, when active directional drilling is occurring. Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures. Contingency: The magnitude of the residual effect is considered non-significant therefore no contingency is required provided the recommended mitigation measures and best management practices are applied.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		Refuse and other material should be appropriately' disposed of off-site. Minimize vehicle traffic on exposed soils during site clearing, grubbing, grading, and top soil removal. Operate construction equipment (i.e. cranes, back hoes, etc.) in a manner that minimizes disturbance to the banks of water bodies and stays outside of the water bodies and bank area. Store any stockpiled material more than 30 m from water bodies. Work in dry conditions (i.e. low flow period) or isolate in-water work area using good engineering practices and dewatering techniques. Install silt fencing in-water downstream of dewatering activities. Dewatering discharge rates should be evaluated as to not result in erosion and sedimentation to receiving water body. Dewatering discharge should be dissipated (i.e. sand bags, hay bales, etc.) and may require to be split to more than one location. Implement the Stormwater Management Plan. Implement fugitive dust suppression techniques when necessary to suppress dust, as determined by the general contractor and/or the environmental monitor. Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application.		
Water Quality Impairment.	Minimize any negative impacts to water quality.	The general contractor will develop a spill response plan and train staff on appropriate procedures. The general contractor will develop a	The Water Body Assessment was undertaken as per MOECC guidelines	Monitoring: Water quality monitoring will be conducted prior to discharging from dewatering to obtain baseline

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		'frac-out' contingency plan and train staff on appropriate procedures during the construction phase. Locate all entry and exit pits for directional drilling at a sufficient distance to meet minimum depths as established by geotechnical studies to prevent 'frac-out'. Locate drilling entry/exit shafts at least 3m from riparian vegetation or top of bank, whichever is greater, or at a distance otherwise agreed upon with regulatory agencies. Keep emergency spill kits on site. Keep contact information for the MOECC Spills Action Centre in a designated area on-site. Dispose of waste material by authorized and approved off-site vendors. Store hazardous materials in designated areas. Locate all vehicle refueling or washing, as well as the storage of chemical and construction equipment more than 30 m from applicable feature(s). Any discharges to a water body must meet MOECC Policy 2 standards (at or better water quality that than of the receiving water body). Adequately treat any discharge water prior to discharge as to meet MOECC Policy 2 standards (at or better water quality than that of the receiving water body) (i.e. filer bags). Implement fugitive dust suppression techniques to avoid impacting water quality when necessary to suppress dust, as determined by the general contractor and/or the environmental monitor.	and this Project is expected to receive confirmation from the MOECC. The likelihood and magnitude of this residual effect is considered non-significant.	conditions, and then once per week during discharge at the end point of dewatering or as described by agencies to ensure water quality meets provincial standards. Surface water quality sampling will be conducted prior to the onset of construction and should meet agency requirements as to adequately establish baseline conditions. During construction, frequent measurements of in-situ parameters and turbidity, as well as any other general water quality parameters as required by agencies, should be obtained. Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures. Contingency: The magnitude of the residual effect is considered non-significant therefore no contingency is required provided the recommended mitigation measures and best management practices are applied.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application.		
In-water work.	Minimize sedimentation and disturbance to water body structure and function.	Perform in-water work (if required) in the dry (i.e. low flow period) where possible. If this is not possible, short-term isolated dewatering will be required. Prior to dewatering, isolate the work area with the installation of a temporary water containment structure (i.e., cofferdams). The structure should form an impermeable enclosure, which also prevents escape of debris and sediment to the exterior water body. Construct a by-pass channel to maintain flow through the watercourse and prevent water from back flooding and ultimately overtopping the water containment structure. Install silt fencing in-water downstream of water containment structures. When using a water containment structure, a qualified fisheries biologist will remove any fish prior to dewatering work area and after any flooding or inundation of the work area. Machinery should be operated in a manner that minimizes disturbance to the banks and bed of the watercourse. Stabilize banks as soon as possible after construction disturbance (i.e. plantings, rock etc.). Any in-water work must also adhere to in-water work restriction windows , as determined through consultation with the local MNRF. Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application.	The Water Body Assessment was undertaken as per MOECC guidelines and this Project is expected to receive confirmation from the MOECC. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Monitor by-pass channels, if applicable, daily to ensure it is functioning appropriately and water is flowing through as designed. Monitoring will be conducted once prior to the onset of construction to document existing conditions. During in-water work, as well as work within 30 m of a water body, monitoring will be conducted daily to identify any changes in aquatic habitat from baseline conditions. When work is occurring >30-120 m from a water body, monitoring will be conducted weekly to identify any changes in aquatic habitat from baseline conditions. Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures. Contingency: The magnitude of the residual effect is considered non-significant therefore no contingency is required provided the recommended mitigation measures and best management practices are applied.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
Soil Compaction.	Maintain soil infiltration capacity.	Restrict construction equipment to designated controlled vehicle access routes to minimize the potential for soil compaction. Staging areas should be located away from water bodies (i.e. 30 m). Avoid construction during high volume rain events (20 mm in 24 hours) and significant snow melts/thaws where possible and resume once soils have stabilized to avoid risk of erosion, soil compaction or the potential for sediment release into nearby watercourses Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application.	The Water Body Assessment was undertaken as per MOECC guidelines and this Project is expected to receive confirmation from the MOECC. The likelihood and magnitude of this residual effect is considered non-significant.	Environmental supervision during construction as part of a routine inspection program will be implemented to ensure adherence to the prescribed mitigation measures. Contingency: The magnitude of the residual effect is considered non-significant therefore no contingency is required provided the recommended mitigation measures and best management practices are applied.
Emissions to Air, including Odour and Dust				
Reduction in air quality due to CAC emissions and dust.	Minimise deterioration of air quality.	Ensure proper operation and maintenance of vehicles and machinery to limit noise, CAC emissions and leaks. Use water or water-based dust suppressant to control dust on unpaved roads. Implement speed limits on unpaved roads. Minimize vehicular traffic on exposed soils and stabilize high traffic areas with clean gravel surface layer or other suitable cover material. Minimize mud tracking by construction vehicles along access routes and areas outside of the immediate work site, and ensuring timely cleanup of any tracked mud, dirt and debris. Cover or otherwise contain loose construction materials that have potential to release airborne particulates during transport, installation or removal. Restore temporary construction road	The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Track all complaints and conduct follow-up monitoring (see Complaints Resolution Process in emergency Response and Communications Plan Section 7 of the Design and Operations Report (DOR)) Contingency: The magnitude of the residual effect is considered non-significant therefore no contingency is required provided the recommended mitigation/compensation measures and best management practices are applied.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		areas as soon as possible to minimize the duration of soil exposure.		
Noise				
Increase in noise levels in Project study area.	Minimise noise increases for inhabited areas.	Ensure proper operation and maintenance of vehicles and machinery to limit noise, CAC emissions and leaks. Implement speed limits on unpaved roads. Construction equipment will be kept in good condition and will not exceed the noise emissions as specified in MOECC publication NPC-115 and any applicable municipal by-laws	The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Track all complaints and conduct follow-up monitoring (see Complaints Resolution Process in emergency Response and Communications Plan Section 7 of the DOR) Contingency: Faulty equipment resulting in increased noise levels are to be repaired in a timely fashion.
Local and Provincial Interests, Land, Use and Infrastructure				
Increased congestion due to increase in truck traffic and short-term lane closures on local roads during delivery of Project components.	Minimise disturbance to local community and achieve zero human safety incident.	Notify the community in advance of construction delivery schedules and installing signage to notify road users of construction activity. If required by municipal authorities develop a traffic management plan for the construction phase and submit to the Municipalities prior to construction and communicate truck routes.	The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Track all complaints and conduct follow-up monitoring (see Complaints Resolution Process in Emergency Response and Communications Plan Section 7 of the DOR) Contingency: The magnitude of the residual effect is considered non-significant therefore no contingency is required provided the recommended mitigation/compensation measures and best management practices are applied.
Damage to local infrastructure.	Minimise damage to local infrastructure.	Adhere to the best practices regarding the operation of construction equipment and delivery of construction materials. If required by municipal authorities, undertake roads condition survey prior to construction and post-construction.	The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Track all complaints and conduct follow-up monitoring (see Complaints Resolution Process in Emergency Response and Communications Plan Section **Error!**

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
				Reference source not found. of the DOR) Contingency: If required by local authorities, return damaged infrastructure to original condition (or better) where appropriate.
Areas Protected under Provincial Plans and Policies				
N/A				
Public Health and Safety				
Effects on public health and safety during construction have been described above under Emissions to air, including Odour and Dust, Noise and Local and Provincial Interests Land Use and Infrastructure.	-	-	-	-
Other Resources				
Potential impacts to petroleum wells or facilities (APRD)	No negative effects on petroleum resources or the renewable energy project	As part of the APRD and as per the MNR "Template for Renewable Energy Projects: Setbacks from Petroleum Operations" a search was conducted using the OGSR database to identify any petroleum wells or facilities within 75 m of project infrastructure. The search concluded that there are three active petroleum wells or facilities existing within 75 m of the Project location. Notice of the findings will be reported to the local District MNR office.	The likelihood and magnitude of this residual effect is considered non-significant.	The magnitude of the residual effect is considered non-significant therefore no monitoring or contingency is required provided the recommended mitigation measures and best management practices are applied.

4.1.2 Operations

Table 4-3: Potential Negative Effects and Mitigation Measures – Operations

Potential Effect	Performance	Mitigation/Compensation	Residual Effect	Monitoring / Contingency

	Objective	Measures		
Cultural Heritage				
Alteration of the visual character of a cultural heritage sites.	Minimize visual impact of recognized heritage sites.	Conduct a Heritage Assessment and apply measures recommended by the heritage specialist or by MTCS. Details of the Heritage Assessment can be found in the reports on this subject as part of the complete REA application package.	The Heritage Assessment was undertaken as per MTCS guidelines and no cultural heritage sites were identified. The likelihood and magnitude of this residual effect is considered non-significant.	The magnitude of the residual effect is considered non-significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures are applied.
Natural Heritage				
Application of herbicides – Significant natural features and SWHs	Protection of native vegetation species. Minimize impacts to local wildlife and their habitats.	Avoid herbicides (Project activities only) within 30 m of significant natural features or SWHs. Details of the NHA can be found in the reports on this subject as part of the complete REA application package.	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive confirmation from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	The magnitude of the residual effect is considered non-significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures are applied.
Direct disturbance or mortality of birds and/or bats due to operational wind turbines.	Avoid direct mortalities and disturbance to birds and/or bats.	Develop a Bird and Bat EEMP in accordance with MNRF's Birds and Bird Habitats (OMNR 2011a) and Bat and Bat Habitats (OMNR 2011b). If impacts to bats are observed to be above provincial thresholds, operational mitigation will be implemented. Details of the NHA can be found in the reports on this subject as part of the complete REA application package.	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive confirmation from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: Post-construction monitoring will be conducted following the Birds and Bird Habitats (OMNR 2011a) and Bats and Bat Habitats (OMNR 2011b) provincial guidelines for a minimum of three years after the Project has become operational. Contingency: Annual reports which document the results of disturbance and mortality monitoring, will be prepared following each year that monitoring occurs. The reports will be submitted to the MNRF and the results presented in these annual reports will be

				used to determine if any additional mitigation measures should be implemented during the operational phase of this Project. Details of the post-construction monitoring program are found in the NHA documents.
Disturbance of local wildlife – significant Amphibian Breeding Habitat [Woodland], Bat Maternity Colony, Bird Species of Conservation Concern Habitats (excludes Bald Eagle Habitat), Colonially-Nesting Breeding Bird Habitat [Trees/Shrubs], Landbird Migratory Stopover Area.	Avoid disturbance to identified habitats.	If confirmed significant, schedule regular (non-critical) Project maintenance activities within 30 m of significant amphibian habitats to occur during daylight hours to avoid excessive noise and/or light disturbances, wherever possible. If Project maintenance activities within 30m of significant wildlife habitats must occur outside of daylight hours, spotlights will be directed downward and/or away from the features to limit potential light disturbance to amphibians. Details of the NHA can be found in the reports on this subject as part of the complete REA application package.	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive confirmation from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: The magnitude of the residual effect is considered non-significant therefore no monitoring is required provided the recommended mitigation/compensation measures are applied. Contingency: If confirmed significant, where regular Project maintenance activities within 30m of significant habitats must occur outside of daylight hours, spotlights will be directed downwards and/or away from the identified habitats.
Adherence to Wildlife Timing Windows (Bald Eagle Habitat).	Avoid potential disturbance and displacement of nesting bald eagles.	Schedule regular (non-critical) vegetation maintenance activities located within 120m of the tertiary zone (as determined by site-specific surveys), to occur outside of the critical period for bald eagles (March 1st - May 15th), whenever possible. If regular vegetation maintenance must occur during the period of March 1st to May 15th, have a biologist confirm birds will not be impacted by maintenance activities. Schedule regular (non-critical) Project maintenance activities within 120m of significant bald eagle habitat to occur during daylight hours to avoid excessive noise and/or light disturbances to wildlife, wherever possible. If Project maintenance activities within 120m of significant bald eagle	The NHA was undertaken as per MNRF guidelines and this Project has received confirmation from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	The magnitude of the residual effect is considered non-significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures are applied.

		habitat must occur outside of daylight hours, spotlights will be directed downward and/or away from the features to limit potential light disturbance to bald eagles. Details of the NHA can be found in the reports on this subject as part of the complete REA application package.		
Soil or water contamination – spills.	Avoid contamination of significant natural features.	Implement best management practices. Develop a spill response plan and train staff on appropriate procedures. Keep emergency spill kits on site. Vehicle washing, refuelling stations, and chemical storage will be located more than 30 m from natural features or water bodies. Dispose of waste material by authorized and approved off-site vendors. Keep contact information for the MOECC Spills Action Centre in Designated Areas. Details of the NHA can be found in the reports on this subject as part of the complete REA application package.	The NHA was undertaken as per MNRF guidelines and this Project has received confirmation from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	Monitoring: The magnitude of the residual effect is considered non-significant therefore no monitoring is required provided the recommended mitigation/compensation measures are applied. Contingency: In the event of a spill, notify the MOECC Spills Action Centre, immediately stop work, and ensure all efforts are made to completely remediate affected areas, especially prior to rain events. If degradation of a significant natural feature or SWH occurs as a result of the spill, appropriate contingency measures will be implemented, which may include re-establishing mitigation measures, habitat remediation, and/or seeding of permanently damaged areas depending on the extent of degradation incurred.
Impacts to Species at Risk.	Limit impacts to Species at Risk.	The Project may require a permit under the ESA, upon completion of an APRD. This report will be submitted to the local district MNR to be reviewed under the authority of the *Ministry of Natural Resources Act*, and will not be submitted as part of this completed REA application.	NA	NA
Water Bodies				

Water quality impairment.	No impairment of water quality.	Implement Spill Response Plan. Address any impacts resulting from design or construction phases. Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application package.	The Water Body Assessment was undertaken as per MOECC guidelines and this Project is expected to receive confirmation from the MOECC. The likelihood and magnitude of this residual effect is considered non-significant.	The magnitude of the residual effect is considered non-significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures are applied.
Emissions to Air, including Odour and Dust				
Emissions of contaminants from maintenance vehicles.	Limit impact of maintenance vehicles on local air quality.	Ensure proper maintenance and operations of vehicles and machinery to limit noise, CAC emissions and leaks.	The likelihood and magnitude of this residual effect is considered non-significant.	Track all complaints and conduct follow-up monitoring if required by regulation (see Complaints Resolution Process in Emergency Response and Communications Plan Section **Error! Reference source not found.** of the Design and Operations Report (DOR)).
Noise				
Increase in noise levels	Minimize noise level increases in the Project area. Comply with MOECC's permissible sound limits at all identified Points of Reception. Receive limited complaints.	Apply the minimum REA setback distance of 550 m from non-participating PoRs. For all turbines, calculate noise levels at PoRs and design project to comply with MOE noise guidelines. Details of the NIA can be found in the reports on this subject as part of the complete REA application package.	The likelihood and magnitude of this residual effect is considered non-significant.	Implement the communications plan and address noise complaints during operations (see Complaints Resolution Process in Emergency Response and Communications Plan Section **Error! Reference source not found.** of the DOR). Faulty equipment resulting in increased noise levels are to be repaired in a timely fashion.
Local and Provincial Interest, Land Use and Infrastructure				
Reduction of forested area.	Minimize reduction of forested area.	Design project to minimize loss of forested area. Implement Reclamation Strategy at the end of construction, namely to reinstate initial conditions on	The likelihood and magnitude of this residual effect is considered non-significant.	The magnitude of the residual effect is considered non-significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures are

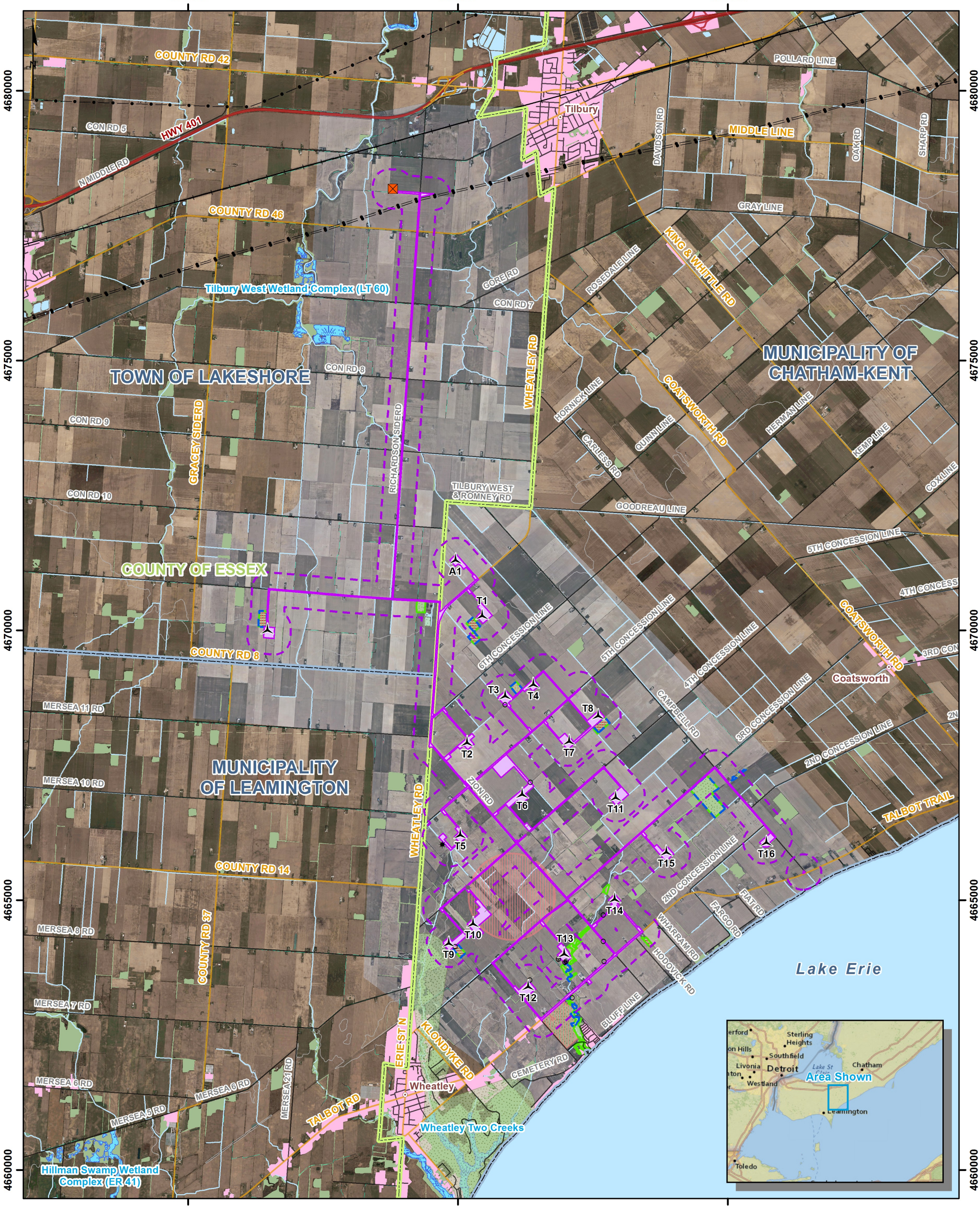
		temporary areas used during construction. Compensate landowners on Project Location as per land lease agreement.		applied.
Areas Protected under Provincials Plans and Policies				
N/A				
Public Health and Safety				
Incidents resulting from ice shed.	No public health and safety incidents.	Design turbine layout to respect a 20m setback from any building. Implement Communications Plan namely to inform local communities of icing events and place signs in areas with safety concern, when applicable.	The likelihood and magnitude of this residual effect is considered non-significant.	Track all complaints and conduct follow-up monitoring if required by regulation (see Complaints Resolution Process in Emergency Response and Communications Plan Section 7 of the DOR). In most cases, turbines automatically shut-down during icing events. Operation of turbine is resumed only after appropriate confirmation of safety.
Radio communication and Radar Systems				
Interference to systems from turbines.	Avoid interference to all identified and registered systems.	Design turbine layout to avoid radio communication systems (towers and microwave links) as per best practice setbacks. Notify and receive clearance from NAV CANADA, RCMP, GMCO, EC, CCG and DND.	The likelihood and magnitude of this residual effect is considered non-significant.	The magnitude of the residual effect is considered non-significant therefore no monitoring or contingency is required provided the recommended mitigation/compensation measures are applied.

5 REFERENCES

[1] Ontario Regulation 359/09, made under the Environmental Protection Act, Renewable Energy Approvals under Part 1.0 of the Act.

[2] Technical Guide to Renewable Energy Approvals, Ontario Ministry of the Environment, 2013.

APPENDIX A – PROJECT LOCATION MAP



Legend

Project Features
- Wind Turbine (18)
- Substation
- Project Location
- Project location (300m)

Other Components

Petroleum Wells (75m)
- Abandoned Well
- Active Well
- No Well Found
- Unknown

- Highway
- Arterial / Collector
- Local Road / Street
- Transmission Line
- Railroad
- Permanent Watercourse (LIO)
- Intermittent Watercourse (LIO)
- Municipal Drain
- Contour (Interval : 5 m)
- Waterbody (LIO)
- Wetland (LIO)
- Provincially Significant Wetland (LIO)
- Wooded Area (LIO)
- Built Up Area
- County Boundary
- Municipal Boundary

Significant Natural Heritage Features (NRSI)
- Wetland (NRSI)
- Woodland (NRSI)
- Significant Habitats for Species of Conservation Concern
- Significant Specialized Wildlife Habitats
- Generalized Significant Wildlife Habitat

0 2.5 5 Kilometers

ROMNEY wind energy centre

Project Location Map

10004025-170323-001-LB

March 23, 2017

Layout version 65

Projection: UTM Zone 17, NAD83

Source: Land Information Ontario, ArcGIS Online, Municipality of Chatham-Kent, OGSR, Airborne Imaging (April 2016), GE imagery, NRSI

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