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ROMNEY
wind energy centre

ROMNEY WIND ENERGY CENTRE

Design and Operations Report

Romney Energy Centre Limited Partnership

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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.
BHRs	Built Heritage Resources
CEAA	*Canadian Environmental Assessment Act*
CHLs	Cultural Heritage Landscapes
CHVI	Cultural Heritage Value or Interest
DNV GL	GL Garrad Hassan Canada Inc.
DOR	Design and Operations Report
EC	Environment Canada
EDF EN	Électricité de France Énergies Nouvelles
EIS	Environmental Impact Study
ESA	Endangered Species Act
EPA	Ontario *Environmental Protection Act*
Hydro One	Hydro One Network Inc.
H&S	Health and Safety
IBAs	Important Bird Areas
IESO	Independent Electricity System Operator
MNRF	Ontario Ministry of Natural Resources and Forestry
MOECC	Ontario Ministry of the Environment and Climate Change
MTCS	Ontario Ministry of Tourism, Culture and Sport
MW	Megawatt
NIA	Noise Impact Assessment
OHSA	Ontario Occupational Health and Safety Act
O&M	Operations and Maintenance
O.Reg.	Ontario Regulation
PoRs	Points of Reception
PLSA	Property Line Setback Assessment
PSWs	Provincially Significant Wetlands
RCMP	Royal Mounted Canadian Police
REA	Renewable Energy Approval
SCADA	Supervisory Control and Data Acquisition
SARA	Species at Risk Act
SWHs	Significant Wildlife Habitats
VLR	Vacant Lot Receptor
WTG	Wind Turbine Generator
ZOI	Zone of Influence

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 [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 Draft Design and Operations Report (DOR) has been prepared in accordance with Table 1 of O. Reg 359/09 and the Technical Guide to Renewable Energy Approvals, Chapter 6: Guidance for preparing the Design and Operations Report [2]. Table 1-1 presents the corresponding section for each DOR requirement.

Table 1-1: Design and Operations Report Requirements and Corresponding Sections

Requirement	Section
Site Plan	Section 3
Facility Design Plan	Section 4
Facility Operational Plan	Section 5
Environmental Effects Monitoring Plan	Section 6
Emergency Response and Communication Plan	Section 7

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 Sideroad and Wheatley Road near the community of Wheatley, ON. 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 including junction boxes 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 either the Proponent or 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 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

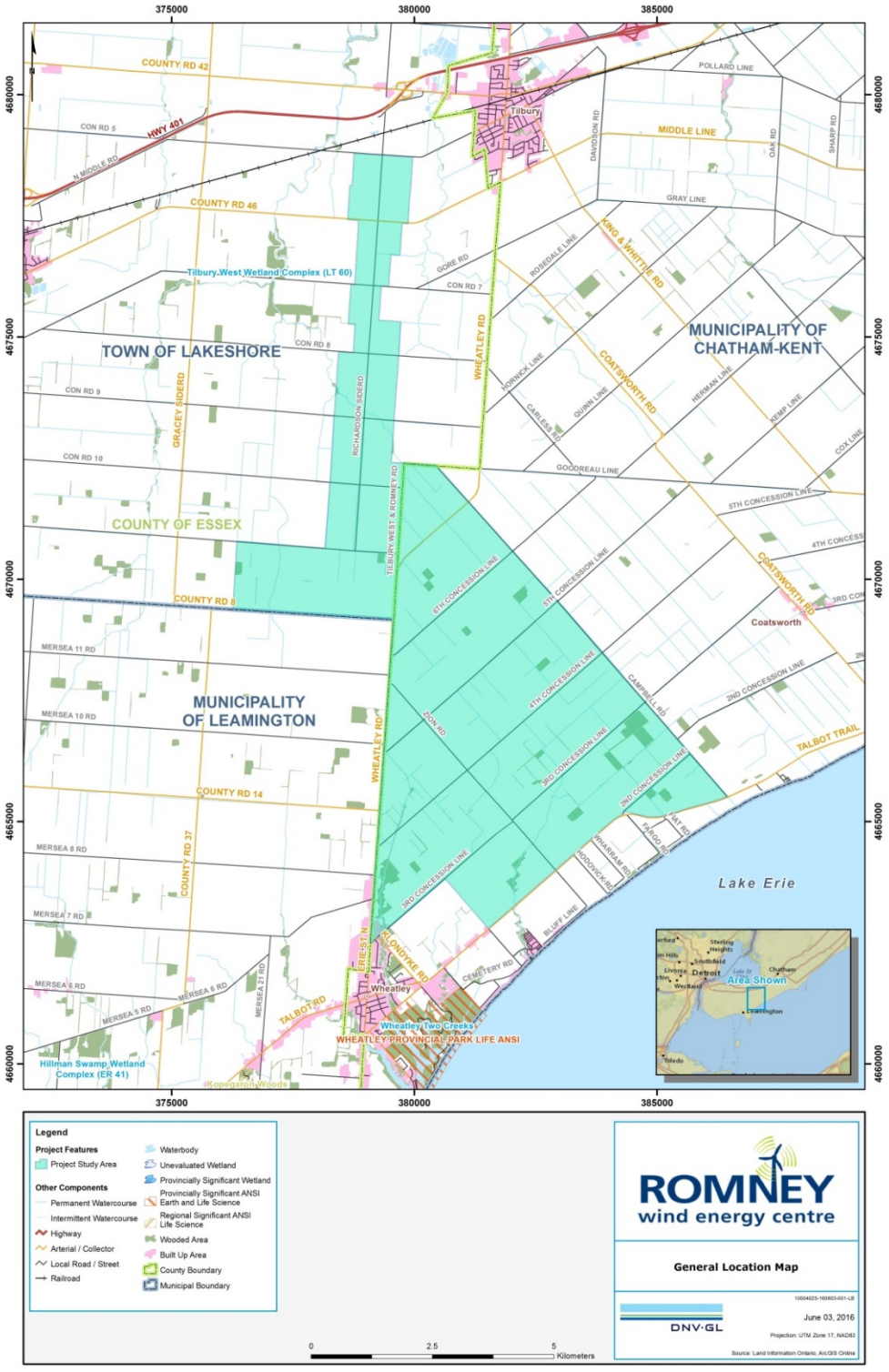

Figure 2-1: General Project Study Area

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 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 project*". 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 shown in the Site Plan Maps 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 above, no permanent infrastructure is proposed within these areas. Following construction activities, the land will be returned to a condition suitable to the land-owner and local authorities.

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

The wind turbine generators (WTGs) for 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 and Amjiwnaang First Nation. The primary contact for this Project is:

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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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3 SITE PLAN

3.1 Project Optimization Strategy

The Project study area presented the previous section and the site plans found in Appendix A, detail the location of facility components, natural features, noise receptors, required setbacks and lands within 300 m of the Project location. A description of the significant features found on the site plans, including Project components, cultural heritage features, natural features and noise receptors is found in the next sub-sections.

The exercise of siting a wind farm is an iterative process that involves balancing several design factors, such as wind resources, prescribed setbacks, environmental and cultural heritage constraints, engineering constraints, and landowner preferences.

The proposed Project design takes all of these factors into consideration, namely the setback distances prescribed in O.Reg 359/09, as outlined in the following table, as well as several other best practice setbacks to minimize impact as much as possible. As per REA, "consultation zone" buffers are also set to indicate within which distance an Environmental Impact Study (EIS) or a Property Line Setback Assessment (PLSA) may be required. Wherever possible, the Project was sited to avoid these consultation zone buffers.

Table 3-1: Ontario Regulation 359/05 Setback Distances

Components	Setback	Note
Built Environment Setbacks		
Point of Reception (dwelling, campground, school, church, picnic site, cemetery, Vacant Lot Receptor, etc.)	550 m and max PSL of 40 dBA as per MOECC noise guidelines	The setback distance is to be measured from the center of the turbine base to the noise receptor.
Lot line	Hub Height	Blade length + 10 m (requires Property Setback Assessment)[1]
Road and railways	Blade + 10 m	Blade length + 10 m, measured form the center of the turbine base to the boundary of the right-of-way.
Natural Features and Water Bodies Setbacks[2]		
Significant Natural Feature	120 m	Measured from the Project location boundary to the nearest point of the natural feature. Project components may be sited closer than the prescribed setback if an EIS is completed.
Water Body	120 m	Measured from the average annual high water mark of a lake or permanent/intermittent stream. Components may be sited closer than the prescribed setback if a Water Body Report is prepared. Note that turbines or transformers may not be sited closer than 30 m to these features.
Petroleum Resource	75 m	Setback distances may be reduced with the submission of a Petroleum Engineer report submission to the Ministry of Natural Resources (MNRF).

[1] Can be reduced if lot abutting parcel of land is owned by the Proponent, or if landowner of abutting parcel has a written agreement with the Proponent to place a turbine closer than blade + 10 m.

[2] Can be reduced with appropriate Environmental Impact Statements or engineers report.

3.2 Facility Components

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

- Wind turbine generators;
- Permanent meteorological tower(s);
- Access roads and crane pads;
- Electrical collector lines, junction boxes, substation and interconnect;
- Operations and maintenance (O&M) building; and
- Construction staging and laydown areas (including temporary staging areas).

Facility components have been clearly depicted in the site plans included within Appendix A and are described in greater detail within Section 4 (Facility Design Plan) of this report.

3.3 Features of the Project Area

Desktop and field studies were undertaken to identify and describe the features in the area that may be affected by the construction and/or operation of the wind energy facility. The following sections summarize the results of these studies.

3.3.1 Cultural Heritage (Archaeological and Heritage Resources)

Detailed archaeological assessments have been prepared and submitted to the Ministry of Tourism, Culture and Sport (MTCS) for acceptance and recommendation. A copy of the complete reports and confirmation letter from the MTCS wil be included in the complete REA application package for this Project.

Archaeological Features

Stage 1 and 2 archaeological assessments [3] were conducted by Archaeological Research Associates Ltd. (ARA) and will be submitted to the MTCS for review.

The results of the studies indicated that one site (Site 7), containing an isolated fragment of Pre-Contact lithic debitage, was located within the Project location. The artifact did not possess any significant diagnostic value. The reports concluded that no further archaeological assessments are recommended for the Project location. All archaeological field work was conducted according to the MTCS's 2011 Standards and Guidelines for Consultant Archaeologists [4]. One or more of the identified areas of archaeological potential within the project locations T2, T6/O&M, T9, T10, T11, T14, T17, T19, the O&M and the Grid Tap were not subject to Stage 2 survey due to inappropriate field conditions. All remaining field work will be completed during the 2017 season and documented in a separate report.

Copies of the Stage 1 and 2 archaeological assessments are provided in Appendix D. These reports will be accepted into the Ontario Public Register of Archaeological Reports by the MTCS prior to the complete REA application package being submitted to the MOECC.

Heritage Features

A heritage assessment for the Project was conducted in February 2017 [5] by ARA. The assessment concluded that there are no Protected Properties within or abutting the area of the proposed transmission line. Fourty-eight Built Heritage Resources (BHRs) and two Cultural Heritage Landscapes (CHLs) were found to have known or potential cultural heritage value or interest (CHVI), as per the *Ontario Heritage Act*. Among these, five BHRs and one CHL were located on participating properties, while the others were located on properties abutting participating properties and/or a electrical collector line. None of these resources are recognized through a designation or listing in the Municipal Heritage Register.The Project will result in a direct impact to six identified cultural heritage resources from the change in land use from agricultural land to renewable energy production. Minimal land is to be removed from agricultural use during construction (approximately 2 ha) and during operations the affected land will be reduced to approximately 0.1 to 0.2 ha. All affected land will be returned to its former use at the end of the Project's life.

One identified cultural heritage resource could potentially be impacted by vibrations related to the installation of collector cables as it falls within the construction vibration zone of influence (ZOI). If

possible, construction activities will be setback such that the heritage feature is not within the ZOI. If this avoidance measure cannot be implemented, vibrations will be minimized using smaller equipment. If this minimization measure cannot be implemented, a more detailed vibration analysis will be undertaken by a qualified engineer to better understand potential impacts.

Assuming the implementation of the planned mitigation measures and a cultural heritage contingency plan (if necessary), significant impacts to these heritage features are unlikely [5]. A copy of the Heritage Assessment Report is provided in Appendix C.

3.3.2 Natural Heritage

A Natural Heritage Assessment (NHA) as per the requirements in the NHA Guide for Renewable Energy Projects [6] was prepared in four separate reports (Records Review, Site Investigation, Evaluation of Significance and EIS) and will be submitted to the MNRF for review and comment prior to submission of the REA applications. These NHA reports are part of the complete REA application package for this Project.

The Project area lies within the Municipality of Chatham Kent and the Town of Lakeshore. The NHA suggests that the Project effects on natural heritage features will be limited and will generally be avoided, provided that the Project design follows REA setback regulations (Table 3-1) and that proper mitigation measures are applied. The majority of the habitat in the Project study area is composed of deciduous, mixed, and coniferous forest, a watercourse, and the occasional wetland.

The NHA indicates that there are no known Provincially Significant Wetlands (PSWs), Provincially Significant Life Science Areas of Natural and Scientific Interest(ANSI), Important Bird Areas(IBAs), Bird Sanctuaries or National Wildlife Refuges within the Project study area.

A detailed evaluation of significance of all potentially significant natural features and wildlife habitats within 120 m of the Project Location was completed. Of those evaluated as significant, three Significant Wildlife Habitats (SWHs) required detailed consideration as part of the EIS. The three SWHs include a rare vegetation community, bald eagle (Haliaeetus leucocephalus) habitat and shellbark hickory (Carya laciniosa) habitat. Bald eagle surveys were conducted at the 1 candidate bald eagle habitat, BAL-001, in 2016. Surveys were conducted from March to mid-August to assess whether the nest was active and to record the behaviour and habitat use of the bald eagles, including any successful juveniles, to support the delineation of habitat zones surrounding the nest in accordance with the Bald Eagle Habitat Management Guidelines (OMNR 1987). The behavioural study focused on the flight patterns, sight lines, perching habitat, and foraging habitat of the nesting eagles and any juveniles in order to refine the habitat zones around the nest. Following the delineation of the habitat zones, project infrastructure was sited well outside of the primary and secondary zones for the eagles. All wind turbines have been sited outside of the primary, secondary and tertiary zones and are located greater than 800 m from the nest. No construction activities will be permitted to occur within the tertiary zone from March 1st to May 15th, during the critical period for bald eagles.

In addition to wildlife habitats that were confirmed to be significant throughout the evaluation of significance, several other wildlife habitats that have potential to be considered significant have been identified. For the purpose of the NHA EIS submission, these habitats have been presumed to be significant. Wildlife habitats that have been presumed to be significant for the purpose of the EIS and

require pre-construction surveys include the following: four eastern wood-pewee (*Contopus viren)* habitats, four louisiana waterthrush (*Parkesia motacilla)* habitats, two cattail Sedge *(Carex typhina)* habitats, two pumpkin ash *(Fraxinus profunda)* habitats, two shumard oak (*Quercus shumardii*) habitats and one amphibian breeding habitat (woodland).

Assuming the implementation of the planned mitigation measures, monitoring programs, and contingency plans (if necessary), there is unlikely to be any significant impacts to natural heritage features, including wetlands, or SWHs [7].

3.3.3 Water Bodies

The Water Body and Water Assessment Reports that characterize the aquatic natural features and habitats in the Project area can be found as part of the complete REA application package.

Comprehensive site investigations for the Project were undertaken by NRSI biologists between 4 October 2016 and 6 October 2016. These site investigations included site-specific habitat assessments of water bodies that are situated throughout the Project area.

Throughout the completion of these studies, NRSI biologists confirmed that a total of 32 permanent or intermittent water bodies are located within the Project area, 18 of which have been identified as overlapping the Project location in one or more locations. The additional 14 confirmed permanent or intermittent water bodies are situated within 120 m of the Project location, ranging in distance from >0.10-110 m but without any direct overlap with the Project components. A total of 36 non-WB stations were assessed during the waterbody evaluation. No lakes, lake trout lakes or seepage areas were identified to be within the Project area.

Water takings, if required, will be conducted as outlined in the Water Body and Water Assessment Reports.

No significant impacts are anticipated on the identified water body features as a result of the development of the Project following the implementation of the proposed mitigation measures [8].

3.3.4 Noise Receptors

The Project study area is considered to be Class 3 (rural) and is defined as a rural area with an ambient noise dominated by natural sounds, with little or no road traffic. Class 3 areas are often the following:

- A small community with a population of less than 1,000;
- An agricultural area;
- A rural recreational area such as a cottage or a resort area; or
- A wilderness area.

As such, ambient sound levels within the study area and on adjacent lands are typical of rural areas of Ontario, with sounds originating from nature, residential activities, agricultural activities (tractors and other machinery), vehicle traffic, and ambient noise induced by wind.

Buildings within 2 km of the Project location are identified in the site plans and for the purposes of preparing the Noise Impact Assessment (NIA), Points of Reception (PoRs) within 1.5 km of the Project

Location have been identified by way of mapping, aerial imagery and a site validation [10]. A total of 395 PoRs were identified for the Project, including dwellings, Vacant Lot Receptors (VLRs) and other buildings considered PoRs under the MOECC's noise guidelines [9].

Wind energy projects have the potential to generate noise which may be perceived under certain circumstances in the general vicinity of the study area, and at specific receptor locations (i.e., residents, hospitals, schools, daycares, places of worship, etc.). A NIA was conducted to evaluate these effects. The results from the NIA show that the Project complies with the applicable MOECC noise limits at all PoRs [10].

The NIA has been included within Appendix G of this report.

4 FACILITY DESIGN PLAN

The present section provides a summary of the Project components.

4.1 Name Plate Capacity and Classification

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.

4.2 Wind Turbines

At the time of this report, the final wind turbine technology has not been selected; however, it is likely to be in the 3 MW+ 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 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 14,526 m^2. 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 plates. A pad mounted transformer will also be located adjacent to or inside the wind turbine. The complete technical specifications for the selected technology will be available in the Wind Turbine Specification Report [11] as part of the complete REA package.

The acoustic emissions data, including the sound power level and frequency, will be detailed in the NIA and will be available as part of the complete REA package.

All Project turbines will meet Transport Canada (TC) requirements from an aviation safety and lighting perspective.

Table 4-1 below provides a summary of the technical specifications for the Vestas V-136.

Table 4-1: Summary of Turbine Technical Specifications

Model	Vestas V-136
Design	Steel, tubular; up to 7 sections
Rated power	3.45 MW
Hub height	132 m
Rotor diameter	136 m
Number of blades	3
Cut-in wind speed	3 m/s
Cut-out wind speed	22.5 m/s
Nominal wind speed	11.5 m/s
Maximum sound power level	105.5 dBA

Additional detail on the turbines is found in Appendix B.

4.3 Permanent Meteorlogical 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).

4.4 Access Roads

Transportation of machinery, turbine components, the 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 construction phase and for maintenance activities during operation, including side clearance. Typically access roads will be built 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, in order to allow access to turbines and associated infrastructure for maintenance and repairs.

4.5 Electrical Collector Lines, Substation and Interconnect

4.5.1 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 in instances where more than one circuit must be connected together. These will be located whether on privately-owned agricultural lots or within public road allowances.

4.5.2 Substation and Interconnect

Measuring a total footprint of approximately 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 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 Ontario Electrical Safety Code standards);
- Containment system;
- Oil / water separator;
- Revenue metering; and
- Control building including supervisory control and data acquisition (SCADA).

A secondary containment system will also be installed 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 and 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.

4.6 Operations and Maintenance Building

It is anticipated that an O&M building will be constructed in the general vicinity of the Project for the purpose of monitoring the day-to-day operations of the Project and supporting maintenance efforts. A small parking lot may also be constructed to accommodate staff vehicles.

Potable water will be supplied by a well or through the municipal water system and a septic bed may be constructed for the disposal of sewage. If required, the 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.

4.7 Construction Staging and Laydown Areas

A temporary construction staging area will be constructed on privately owned lands for the purpose 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 8 ha.

In addition, a temporary area of approximately 80 m diameter 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 maintain agricultural uses.

5 FACILITY OPERATIONS PLAN

5.1 General

The Project operations phase is not anticipated to be resource intensive. Typical activities pertain to the computer-controlled operation of turbines and maintenance.

Each WTG will be connected to the SCADA system which monitors a large number of meteorological and mechanical parameters in real time. If this system detects any condition outside of the normal operating conditions of the turbine (i.e. high wind speeds, overheating of the generator, short circuits, etc.), the WTG will be stopped immediately.

The operations phase activities mainly relate to regular maintenance runs and verification of the Project infrastructure. Two visits are planned per year per turbine for routine maintenance tasks. More significant tasks are planned 5, 10 and 15 years into the operations phase, including a major overhaul after 10 years of operation.

5.2 Use of Meteorological Data

The use of meteorological data is key to the safe and efficient operation of a wind energy centre. Some operational decisions made using meteorological data include:

- Cut-in wind speed;
- Cut-out wind speed;
- WTG shut-down during icing conditions; and
- WTG shut-down during extreme weather events.

5.3 Routine Turbine Maintenance

Routine preventative maintenance activities are scheduled at six-month intervals with specific maintenance tasks assigned to each interval. Maintenance is done by removing the turbine from service and having two to three wind technicians climb each tower and spending the necessary time to carry out the maintenance activities.

Consumables such as the various greases that are used to keep the mechanical components operating, oil filters for gearboxes and hydraulic systems will be used for routine maintenance tasks. Following the maintenance work at each WTG, the area will be cleaned up. All surplus lubricants and grease-soaked rags will be removed and disposed of as required by applicable regulations. All maintenance activities will adhere to the same spill prevention industry best practices undertaken during the construction phase.

5.4 Unplanned Turbine Maintenance

Modern WTGs are very reliable and the major components are designed to operate for approximately 25 years. However, wind turbines are large and complex electromechanical devices with rotating equipment and many components. Therefore, component failures may occur despite the high reliability of the WTG fleet-wide. Most commonly, the failure of small components such as switches, fans, or sensors will take the turbine out of service until the faulty component is replaced. These repairs can usually be carried out by 2-3 technicians.

Unscheduled events involving the replacement of a major component such as a gearbox or rotor are rare and typically occur around year 20-21. If they do occur, the use of large equipment which is

sometimes as large as that used to install the turbines, may be required. Typically only a small percentage of WTGs are required to be accessed with large equipment during their operating life.

5.5 Electrical System Maintenance

The electrical collector lines and the substation equipment will require periodic inspections and preventative maintenance activities. Routine maintenance will include condition assessment for above-ground infrastructure and protective relay maintenance of the substation, in addition to monitoring of the secondary containment system for traces of oil.

5.6 Waste Management

Waste generated during the operations phase will be removed by a licensed operator and disposed of at an approved facility. Any lubricants or oils resulting from WTG maintenance will be drummed on site and disposed of in accordance with applicable provincial regulations. All reasonable efforts will be made to minimize waste generated and to recycle materials including returning packaging material to suppliers for reuse/recycling. The spill prevention protocols followed during construction will continue to be observed throughout the facility O&M activities.

6 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, as part of the complete REA application package.

6.1 Methodological Approach

As requested under REA, potential effects from the construction, installation, decommissioning and operation and of the wind farm are required 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 6-1 below.

Table 6-1: 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.

6.1.1 Construction and Decommissioning

Table 6-2: 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				

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
Direct vegetation removal – Significant woodlands, wetlands and generalized SWH.	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 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	The NHA was undertaken 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: Undertake regular monitoring of the dripline where applicable to ensure 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	Avoid direct impacts on breeding birds and their habitats. Minimize impacts on species that are	Avoid construction and decommissioning activities during the breeding bird period (May 1st – July 31st), wherever possible, to minimize potential disturbance to breeding birds.	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to receive approval	Monitoring: If construction or decommissioning activities must occur during the breeding bird period (May 1st – July 31st), a biologist will conduct nest

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
Generalized SWHs.	relatively inactive at night and not accustomed to nighttime disturbances.	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 reports on this subject as part of the complete REA application package.	from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	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 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.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
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 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.	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: During construction and decommissioning, monitoring of the eagle nest will follow the methods implemented during the evaluation of significance phase of the Project 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 –	Avoid contamination of Significant	The general contractor will develop and implement an Erosion and Sediment	The NHA was undertaken as per	Monitoring:

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
Significant woodlands/wetlands, significant plant habitats, and Generalized SWHs.	woodlands/wetlands, significant plant habitats, and Generalized SWHs.	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, 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	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.	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. 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.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		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.		
Reduced flood attenuation – Significant wetlands and vegetation communities.	Avoid impact on flood attenuation of significant wetlands and vegetation communities.	Clearly delineate work area using erosion fencing, or other barrier, to minimize potential impacts to hydrological connectivity from loss of 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.	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: Undertake regular monitoring of the identified feature(s) to ensure the work area is clearly delineated 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 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	Avoid fugitive dust within	On-site speed limits will be clearly	The NHA was	Monitoring:

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
and Dust Emissions – Significant natural features, SWHs and generalized SWHs.	significant natural features, SWHs, and Generalized SWHs.	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 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.	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.	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 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

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
				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. 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	The NHA was undertaken as per MNRF guidelines and this Project is anticipated to	Monitoring: Regular environmental monitoring will occur at least once every two weeks during the construction and decommissioning phase to ensure

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		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 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.	receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	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, 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	Minimize impact to soil moisture regime and vegetation species	Minimize the use of impervious surfaces where possible, such as utilizing and contouring permeable surface material (i.e. gravel) to increase infiltration, and	The NHA was undertaken as per MNRF guidelines and this Project is	Monitoring: Environmental supervision during construction as part of a routine

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
Generalized SWHs.	composition.	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.	anticipated to receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	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. 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	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: Undertake regular monitoring of significant wetlands 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. 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

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		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.		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 concentrated. 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.	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.
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	The NHA was undertaken as per MNRF guidelines and this Project is	The magnitude of the residual effect is considered non-significant therefore no monitoring or contingency is required provided the

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		phases Details of the NHA can be found in the reports on this subject as part of the complete REA application.	anticipated to receive approval from the MNRF. The likelihood and magnitude of this residual effect is considered non-significant.	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
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).	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

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		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.		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.
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).	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.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		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. 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		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
		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 '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	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 quality monitoring will be conducted prior to discharging from dewatering to obtain baseline 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.

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		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. Details of the Water Body Assessment can be found in the reports on this subject as part of the complete REA application.		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.
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	The Water Body Assessment was undertaken as per MOECC guidelines and this Project is expected to receive confirmation from the MOECC. The likelihood and	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

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		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.	magnitude of this residual effect is considered non-significant.	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.
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	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	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

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
		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.	considered non-significant.	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 areas as soon as possible to minimize the duration of soil exposure.	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.
Noise				

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
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 7 of the DOR) Contingency:

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / 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.

6.1.2 Operations

Table 6-3: Potential Negative Effects and Mitigation Measures – Operations

Potential Effect	Performance Objective	Mitigation/Compensation Measures	Residual Effect	Monitoring / Contingency
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 30m 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 MNR guidelines and this Project is anticipated to receive confirmation from the MNR. 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	The NHA was undertaken as per MNR guidelines and this Project is anticipated to receive confirmation from the MNR. The likelihood and magnitude of this residual effect is considered non-	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:

		package.	significant.	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 30m 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 MNR guidelines and this Project is anticipated to receive confirmation from the MNR. 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	The NHA was undertaken as per MNR guidelines and this Project has received confirmation from the MNR. 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.

		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 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 MNR guidelines and this Project has received confirmation from the MNR. 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.	NA	NA

		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.		
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).
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	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). Faulty equipment resulting in increased noise levels are to be repaired in a timely fashion.

	complaints.			
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 temporary areas used during construction. Compensate landowners on Project Location as per land lease agreement.	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.
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). 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.

7 EMERGENCY RESPONSE AND COMMUNICATIONS PLAN

7.1 Emergency Response

While a Project Emergency Response Plan (ERP) will be implemented throughout all phases of the Project, the following information focuses specifically on the implementation of the plan during the operations phase of the Project.

The purpose of the plan is to establish and maintain emergency procedure, as well as communication measures, required for effectively responding to accidents and other emergency situations, and for minimizing losses. Potential emergency scenarios which could occur during the construction and decommissioning phases include fire, personal injury and spills. In the rare instance that the wind generating facility exceeds operational parameters or there is an emergency, the appropriate regulatory agencies, the Town of Lakeshore, the Municipality of Chatham Kent, and Aboriginal communities will be notified using the procedures outlined below: if there is an emergency, the operator will contact the following representatives at EDF EN:

Stephane Desdunes, Director, Development
Romney Energy Centre Limited Partnership
53 Jarvis St, Suite 300
Toronto, ON, M5C 2H2
Phone: (416) 216-5886
Fax:

Email: stephane.desdunes@edf-en.ca

Mark Gallagher, Senior Developer
Romney Energy Centre Limited Partnership
53 Jarvis St, Suite 300
Toronto, ON, M5C 2H2
Phone: (416) 216-5870
(416) 363-7959
Fax: (416) 363-7959
Email: mark.gallagher@edf-en.ca

The general contractor will be responsible for establishing and maintaining specific construction and decommissioning related emergency response procedures to be implemented during these phases.

7.2 Fire Response

Fire extinguishers will be in compliance with applicable Ontario regulations and strategically located throughout the Project area in places such as: Project vehicles, the O&M building, the nacelles of each turbine, and the substation control building. If a fire occurs, Project personnel will attempt to extinguish it but only if and when it is safe to do so. All project personnel on-site during the life of the Project will be trained in procedures for dealing with a fire and how to use an extinguisher. If there is any risk of personal injury, extinguishing the fire will not be attempted and the local fire department (and ambulance if necessary) will be called immediately. Project personnel will also notify the occupants at all adjacent properties immediately if the fire appears to be spreading beyond the Project site.

During operations, clearly visible signs will be erected. The signs will include instructions to call 911 and the phone number of the operator or owner representative of the Project, should an emergency arise. All incidents will be documented and kept on file. Documentation will include: date of incident, date of reporting, name of reporter, description of the incident, cause of the incident, actions taken, communications to outside groups and internal personnel and follow-up required.

7.3 Personal Injury Response

The Proponent will be responsible during the operations phase to establish their own Health and Safety (H&S) programs in accordance with the *Ontario Occupational Health and Safety Act* (OHSA). If a personal injury were to occur that did not require immediate ambulatory assistance, the injured worker would be taken to the local hospital. The Project O&M building will house first aid supplies as well as maps to the local hospital. An up-to-date list of all personnel with first aid and CPR training will also be kept on display in this building. Should a personal injury occur which does require an ambulance, Project personnel will call 911 and project personnel trained in first aid and/or CPR will provide immediate assistance until the ambulance arrives. In all cases of personal injury, the operator will be notified immediately and the injury will be properly documented (as stated in the OHSA). Documentation shall include: date of incident, date of reporting, name of reporter, name of the injured, description of the incident, cause of the accident, corrective measures, communications to outside groups and internal personnel.

7.4 Spills Response

The following spills procedures are based on the procedures outlined in the MOECC's "Spills Reporting – A Guide to Reporting Spills and Discharges" (May 2007). Spills and the types of spills that require reporting are defined in the *Ontario Environmental Protection Act* and *Ontario Regulation 675/98* "Classification and Exemption of Spills and Reporting of Discharges".

To mitigate the potential for spills during operations, the Applicant will be responsible for ensuring that the Project follows the following guidelines as set out by the MOECC:

- A designated Site Environmental Inspector will be appointed by the Applicant. This person will be responsible for ensuring that a spill clean-up procedure/emergency response plan will be prepared, the appropriate spill clean-up equipment is present on site and that all staff have been trained in proper spill clean-up procedures to implement the event of a spill;
- Emergency contacts will be posted. The list will include the Site Project Manager, Site Health and Safety Manager, Site Environmental Inspector, 911, Police, Fire Department, MOECC Spills Action Centre, and other contacts as required;
- Potentially hazardous materials, fuels and lubricants will be stored in the laydown area, in an impervious, protected, bermed area that is at least 30 m from any watercourses. All refuelling and equipment maintenance activities will be conducted at specified locations;
- Equipment will be monitored to ensure it is well maintained and free of leaks; and
- In the event of a spill, the spill area will be cleaned-up immediately upon detection and reported accordingly and the MOECC Spills Action Centre will be contacted as soon as possible upon detection, as per provincial regulations.

The use of the aforementioned best management measures will prevent negative effects to soils, groundwater, surface water, vegetation and terrestrial or aquatic biota. However, spills that could potentially occur during operations that may need to be reported to the MOECC include:

- Non-approved releases/discharges (including those to land, air and water);
- Discharge of fluids greater than 100 L from a vehicle;
- Mineral oil releases greater than 100 L from an electrical transformer or gearbox; and

- Discharges (including sediment) to waterbodies.

The MOECC Spills Action Centre phone number (1-800-268-6060) will be posted at the Project field office.

Any incidents of spills will be documented as soon as possible, kept on file and sent to the MOECC, as required. The documentation will include: date of incident, date of reporting, name of reporter, description of the incident, cause of the incident, type and amount of material spilled, actions taken, method(s) of disposal taken, and communications to outside groups and internal personnel.

7.5 Communications Plan

The communications plan is included within the ERP.

During all phases of the Project, including operations, a sign will be erected which will include a Project phone number (toll free) and website should the public have any questions, inquiries or complaints. Inquiries will be directed to the Proponent who will respond to the inquiry accordingly. Each complaint will be logged electronically with the following information: date of question, inquiry or complaint, name, phone number, e-mail address of the individual, response, date of response, and any follow-up issues as applicable.

The following agencies will be contacted by the Proponent's representative by phone within four hours of the occurrence of an operational exceedance/emergency:

- MOECC (including the Spills Action Centre, if applicable);
- Town of Lakeshore; and
- Municipality of Chatham Kent.

A hard copy incident response report will be provided within 24 hours of phone or e-mail contact. This report will include the following information:

- The parameter exceeded;
- The magnitude of the exceedance; and
- The mitigation measures implemented, including details of first responders (e.g., fire department, emergency medical services), as applicable and required.

The following individuals will be contacted within four to eight hours of an operational exceedance or emergency, as applicable:

- Stakeholders and local community members; and
- Aboriginal communities.

Local community members will be notified through direct mailing and posting in the local weekly newspaper and media, as deemed necessary. The Aboriginal communities will be asked to assign a key contact for emergency purposes. Information will also be sent to the local band office to be distributed to their members.

Prior to commencing construction, the Proponent will distribute copies of the detailed ERP to the Town of Lakeshore and the Municipality of Chatham Kent, local residents, and Aboriginal communities. The ERP will include information on the:

- Designation of facility emergency coordinators;
- Emergency services orientation and coordination;
- Process description;
- Objectives;
- Administration;
- Regulatory references;
- Training;
- Facility location information;
- Informational signage;
- Facility emergency procedures;
- Immediate site evacuation procedures;
- Delayed site evacuation procedures;
- Personnel injuries/serious health conditions;
- Fire response plan;
- Chemical/oil spills and releases; and
- Weather-related emergencies.

The ERP will be updated prior to each Project phase and will be distributed to the appropriate parties. Methods and paths for communication to regulatory agencies and the public will not change throughout the different Project phases.

8 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.

[3] Archaeological Research Associates Ltd., Stage 1 and 2 Archaeological Assessment, Romney Wind Energy Centre, L-006356-WIN-001-060, 31 January 2017.

[4] Standards and Guidelines for Consultant Archaeologists, Ontario Ministry of Tourism, Culture and Sport's, January 2011

[5] Archaeological Research Associates Ltd., Draft Cultural Heritage Assessment, Romney Wind Energy Centre, L-006356-WIN-001-060, 13 February 2017.

[6] NHA Guide for Renewable Energy Projects, Ministry of Natural Resources, December 2010.

[7] Natural Resources Solutions Inc., Natural Heritage Environmental Impact Study Report, Romney Wind Energy Centre, 13 February 2017.

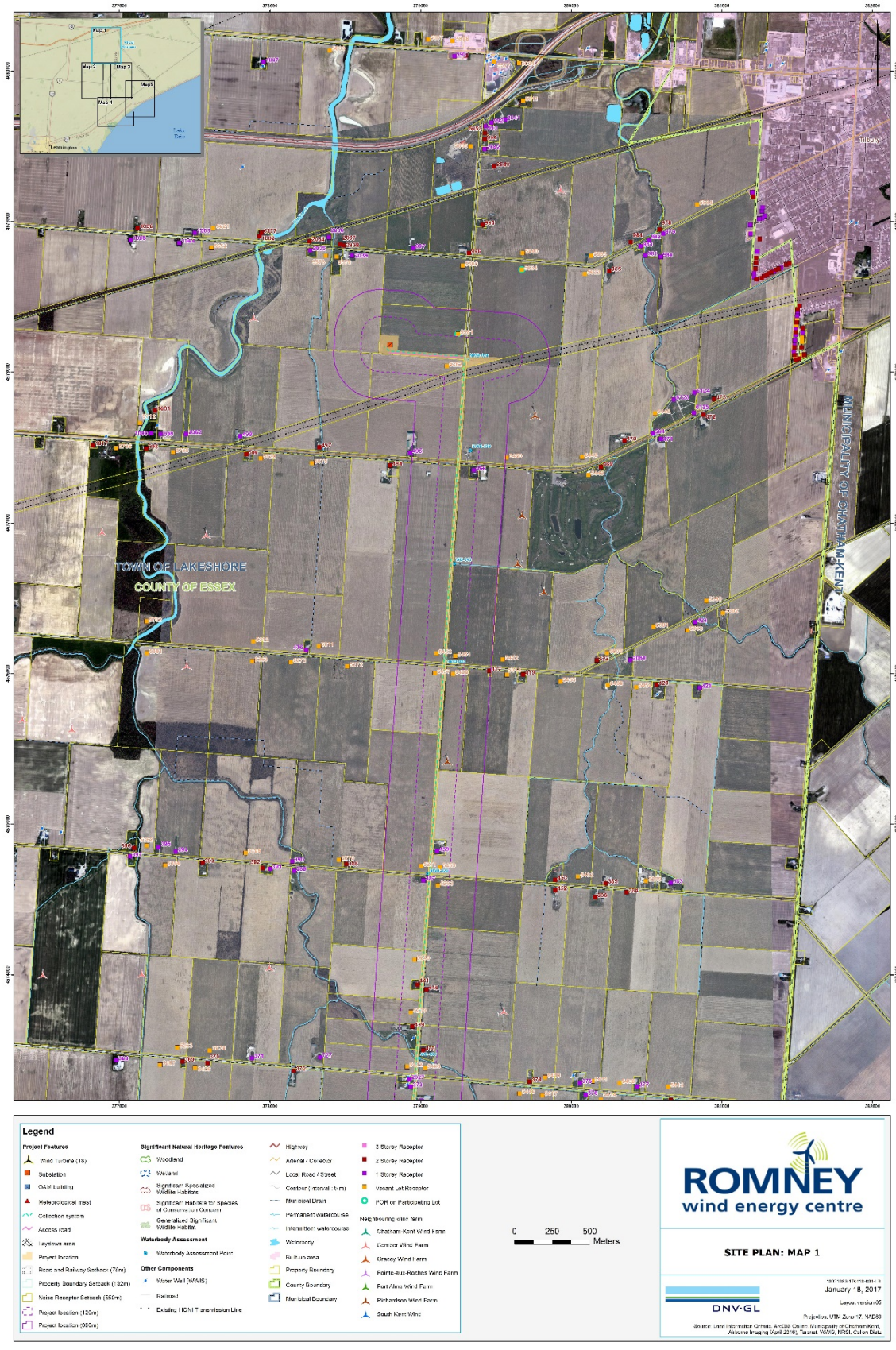
[8] Natural Resources Solutions Inc., Draft Water Bodies Assessment, Romney Wind Energy Centre, 15 February 2017.

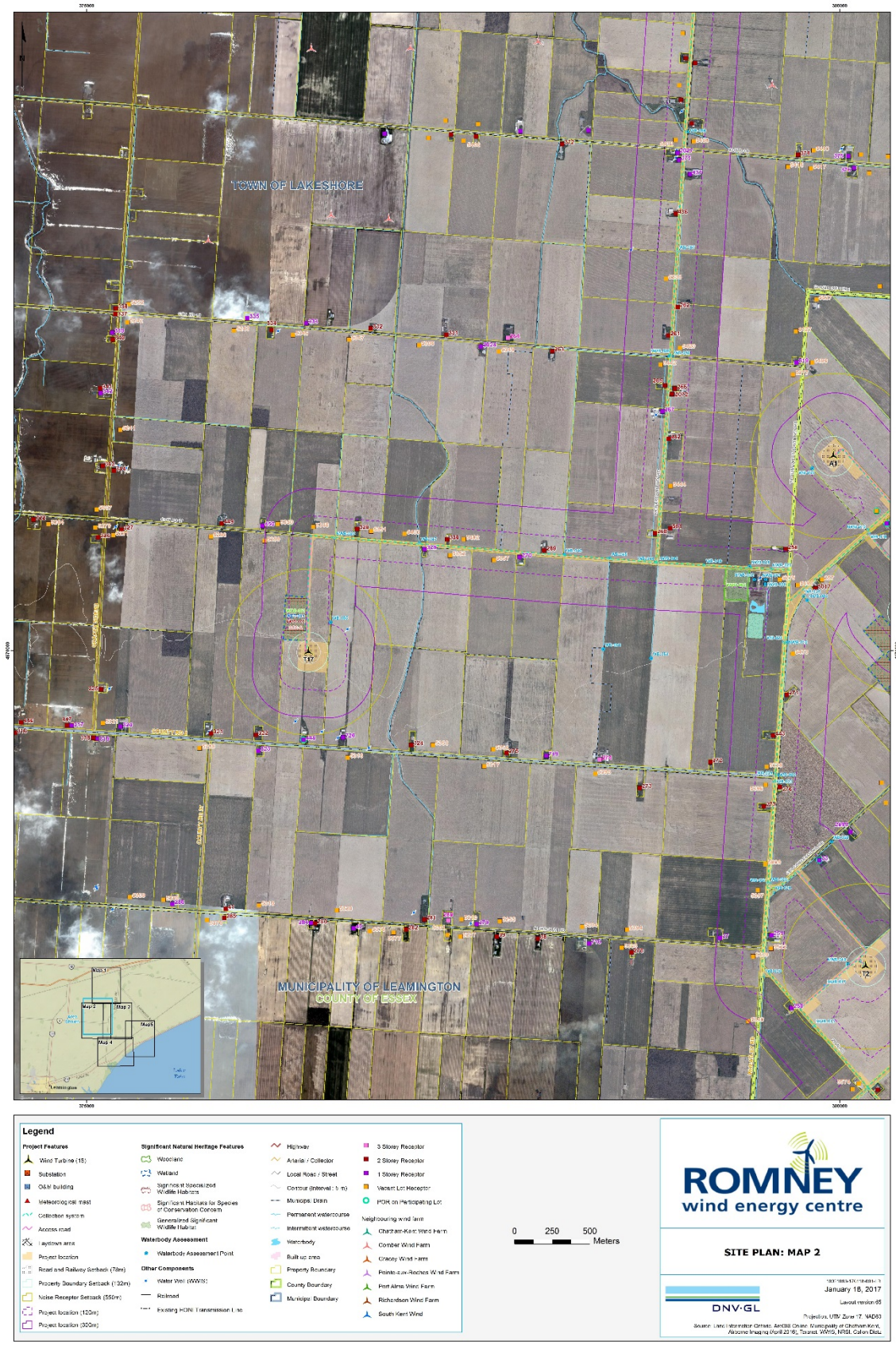
[9] MOECC Noise Guidelines for Wind Farms, May 2016.

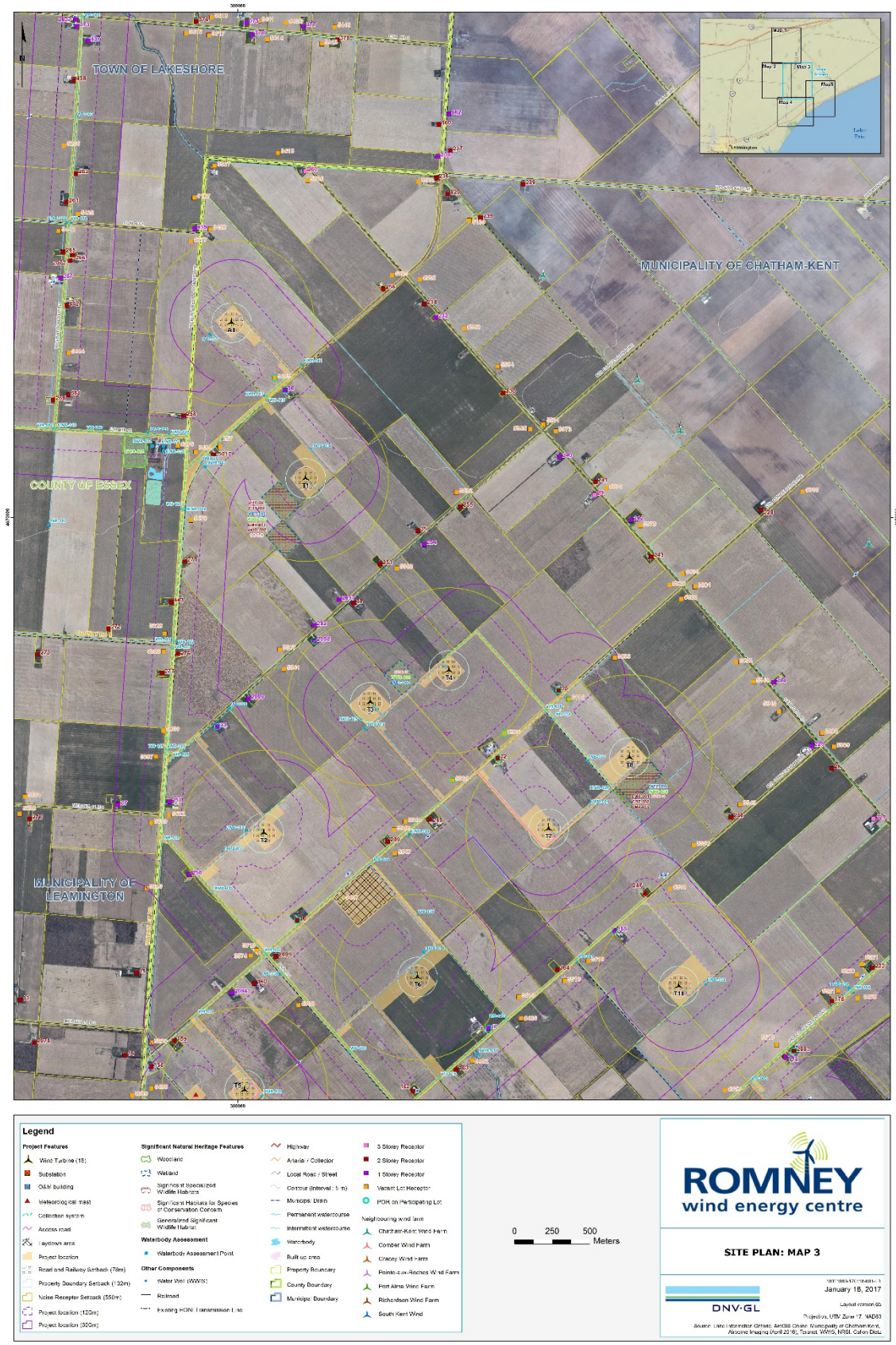
[10] DNV GL, Renewable Energy Approval Application – Noise Impact Assessent, Romney Wind Project, 18 January 2017.

[11] DNV GL, Romney Wind Energy Centre, Specifications report, Wind Facility (Not Class 2), 3 February 2017.

APPENDIX A – SITE PLAN MAPS


TOWN OF LAKESHORE
COUNTY OF ESSEX
MUNICIPALITY OF CHATHAM-KENT
Legend
Project Features
Wind Turbine (18)
Substation
O&M building
Meteorological mast
Collection system
Access road
Laydown area
Project location
Road and Railway Setback (70m)
Property Boundary Setback (122m)
Noise Receptor Setback (550m)
Project location (120m)
Project location (300m)
Significant Natural Heritage Features
Woodland
Wetland
Significant Specialized Wildlife Habitats
Significant Habitats for Species of Conservation Concern
Generalized Significant Wildlife Habitat
Waterbody Assessment
Waterbody Assessment Point
Other Components
Water Well (WWIS)
Railroad
Existing HONI Transmission Line
Highway
Arterial / Collector
Local Road / Street
Contour (interval - 5m)
Municipal Drain
Permanent watercourse
Intermittent watercourse
Waterbody
Built up area
Property Boundary
County Boundary
Municipal Boundary
2 Storey Receptor
2 Storey Receptor
1 Storey Receptor
Vacant Lot Receptor
POR on Participating Lot
Neighbouring wind farm
Chatham-Kent Wind Farm
Comber Wind Farm
Dracey Wind Farm
Pointe-aux-Roches Wind Farm
Port Alma Wind Farm
Richardson Wind Farm
South Kent Wind
0 250 500 Meters
ROMNEY
wind energy centre
SITE PLAN: MAP 1
DNV·GL
January 18, 2017


TOWN OF LAKESHORE
MUNICIPALITY OF LEAMINGTON
COUNTY OF ESSEX
Legend
Project Features
Wind Turbine (15)
Substation
O&M building
Meteorological mast
Collection system
Access road
Laydown area
Project location
Road and Railway Setback (78m)
Property Boundary Setback (132m)
Noise Receptor Setback (550m)
Project location (120m)
Project location (300m)
Significant Natural Heritage Features
Woodland
Wetland
Significant Specialized Wildlife Habitats
Significant Habitats for Species of Conservation Concern
Generalized Significant Wildlife Habitat
Waterbody Assessment
Waterbody Assessment Point
Other Components
Water Well (WWIS)
Railroad
Existing HONI Transmission Line
Highway
Arterial / Collector
Local Road / Street
Contour (Interval: 5 m)
Municipal Drain
Permanent watercourse
Intermittent watercourse
Waterbody
Built up area
Property Boundary
County Boundary
Municipal Boundary
3 Storey Receptor
2 Storey Receptor
1 Storey Receptor
Vacant Lot Receptor
POR on Participating Lot
Neighbouring wind farm
Chatham-Kent Wind Farm
Comber Wind Farm
Cruickshank Wind Farm
Pointe-aux-Roches Wind Farm
Port Alma Wind Farm
Richardson Wind Farm
South Kent Wind
0 250 500 Meters
ROMNEY
wind energy centre
SITE PLAN: MAP 2
January 18, 2017
DNV·GL


TOWN OF LAKESHORE
MUNICIPALITY OF CHATHAM-KENT
COUNTY OF ESSEX
MUNICIPALITY OF LEAMINGTON
Legend
Project Features
Wind Turbine (18)
Substation
O&M building
Meteorological mast
Collection system
Access road
Laydown area
Project location
Road and Railway Setback (78m)
Property Boundary Setback (132m)
Noise Receptor Setback (550m)
Project location (120m)
Project location (300m)
Significant Natural Heritage Features
Woodland
Wetland
Significant Specialized Wildlife Habitats
Significant Habitats for Species of Conservation Concern
Generalized Significant Wildlife Habitat
Waterbody Assessment
Waterbody Assessment Point
Other Components
Water Well (WWIS)
Railroad
Existing HONI Transmission Line
Highway
Arterial / Collector
Local Road / Street
Contour (Interval : 5 m)
Municipal Drain
Permanent watercourse
Intermittent watercourse
Waterbody
Built up area
Property Boundary
County Boundary
Municipal Boundary
3 Storey Receptor
2 Storey Receptor
1 Storey Receptor
Vacant Lot Receptor
POR on Participating Lot
Neighbouring wind farm
Chatham-Kent Wind Farm
Comber Wind Farm
Cruickshank Wind Farm
Pointe-aux-Roches Wind Farm
Port Alma Wind Farm
Richardson Wind Farm
South Kent Wind
0 250 500 Meters
ROMNEY
wind energy centre
SITE PLAN: MAP 3
January 18, 2017
DNV·GL


MUNICIPALITY OF CHATHAM-KENT
MUNICIPALITY OF LEAMINGTON
COUNTY OF ESSEX
Legend
0 250 000
Meters
ROMNEY
wind energy centre
SITE PLAN: MAP 4
DNV·GL


MUNICIPALITY OF CHATHAM-KENT
LAKE
ERIE
Legend
Project Features
Wind Turbine (18)
Substation
O&M building
Meteorological mast
Collection system
Access road
Laydown area
Project location
Road and Railway Setback (78m)
Property Boundary Setback (132m)
Noise Receptor Setback (550m)
Project location (120m)
Project location (300m)
Significant Natural Heritage Features
Woodland
Wetland
Significant Specialized Wildlife Habitats
Significant Habitats for Species of Conservation Concern
Generalized Significant Wildlife Habitat
Waterbody Assessment
Waterbody Assessment Point
Other Components
Water Well (WWIS)
Railroad
Existing HONI Transmission Line
Highway
Arterial / Collector
Local Road / Street
Contour (Interval: 5 m)
Municipal Drain
Permanent watercourse
Intermittent watercourse
Waterbody
Built up area
Property Boundary
County Boundary
Municipal Boundary
3 Storey Receptor
2 Storey Receptor
1 Storey Receptor
Vacant Lot Receptor
POR on Participating Lot
Neighbouring wind farm
Chatham-Kent Wind Farm
Comber Wind Farm
Cruickshank Wind Farm
Pointe-aux-Roches Wind Farm
Port Alma Wind Farm
Richardson Wind Farm
South Kent Wind
0
250
500
Meters
ROMNEY
wind energy centre
SITE PLAN: MAP 5
January 18, 2017
DNV·GL

APPENDIX B – WIND TURBINE SPECIFICATION REPORT

APPENDIX C – HERITAGE ASSESSMENT

APPENDIX D – STAGE 1 AND STAGE 2 ARCHAEOLOGICAL ASSESSMENT

APPENDIX E – NATURAL HERITAGE ASSESSMENT

APPENDIX F – WATER BODY AND WATER ASSESSMENT REPORTS

APPENDIX G – NOISE IMPACT ASSESSMENT

About DNV GL

Driven by our purpose of safeguarding life, property and the environment, DNV GL enables organizations to advance the safety and sustainability of their business. We provide classification and technical assurance along with software and independent expert advisory services to the maritime, oil and gas, and energy industries. We also provide certification services to customers across a wide range of industries. Operating in more than 100 countries, our 16,000 professionals are dedicated to helping our customers make the world safer, smarter, and greener.